



AIR MEASUREMENT SERVICES, INC.

Horizon Test #: W07-042-FRA

Date Tested: April 20, 2005

Report Date: May 26, 2005

Revision Number: 0

**ANNUAL EMISSIONS TEST
OF LANDFILL GAS FLARE #1
BRADLEY LANDFILL**

Permit to Construct No. 425253

Facility ID No. 50310

Prepared for:

**Waste Management Recycling and
Disposal Services of California, Inc.
9081 Tujunga Avenue, 2nd Floor
Sun Valley, California 91352**

Prepared by:

**Horizon Air Measurement Services, Inc.
996 Lawrence Drive, Suite 108
Newbury Park, California 91320**

Regulatory Agency:

**South Coast Air Quality Management District
21865 East Copley Drive
Diamond Bar, California 91765**

Robert D. Carrier

**Robert D. Carrier
Project Manager**

Richard J. Vacherot
**Richard J. Vacherot
Technical Director**



HORIZON

AIR MEASUREMENT SERVICES, INC.

May 26, 2005

Mr. John Workman
Waste Management
25772 Springbrook Road
Saugus, California 91350

Dear Mr. Workman:

Please find enclosed three copies of the final report entitled "Annual Emissions Test of Landfill Gas Flare #1."

If you have any questions please call me at (805) 498-8781.

Sincerely,

HORIZON AIR MEASUREMENT SERVICES, INC.

Robert D. Carrier
Robert D. Carrier
Project Manager

cc: Mr. Andrew Washington, The Shaw Group



TABLE OF CONTENTS

1. INTRODUCTION	Page 1
2. SUMMARY OF RESULTS	Page 4
3. FLARE DESCRIPTION AND OPERATION	Page 6
3.1 Flare Description	Page 6
3.2 Sample Location	Page 6
3.3 Flare Operation During Testing	Page 6
4. SAMPLING/ANALYSES	Page 8
4.1 Sample Location	Page 8
4.1.1 Flare Exhaust	Page 8
4.1.2 Landfill Gas Supply Line	Page 9
4.2 Moisture	Page 9
4.2.1 Inlet - SCAQMD Method 4.1	Page 9
4.2.2 Outlet - SCAQMD Method 5.1	Page 10
4.3 Flow Rate	Page 10
4.3.1 Inlet - SCAQMD Method 2.3	Page 10
4.3.2 Outlet - SCAQMD Method 5.1	Page 10
4.4 Particulate Matter (Outlet) - SCAQMD Method 5.1	Page 10
4.5 Oxides of Nitrogen, Carbon Dioxide, Oxygen (Continuous Emissions Monitoring) - SCAQMD Method 100.1	Page 11
4.6 Hydrogen Sulfide (H ₂ S), and C ₁ - C ₃ Sulfur Compounds (Inlet) - SCAQMD Method 307.91 Equivalent	Page 11
4.7 Speciated Organic Compounds - SCAQMD Rule 1150.1 List	Page 11
4.7.1 Inlet	Page 11
4.7.2 Outlet	Page 11
4.8 Total Non Methane Hydrocarbons, Methane, Carbon Dioxide and Carbon Monoxide	Page 12
4.8.1 Inlet - SCAQMD Method 25.1	Page 12
4.8.2 Outlet - SCAQMD Method 25.3	Page 12
5. RESULTS DISCUSSION	Page 13

APPENDIX A - Sampling and Analytical Methods
APPENDIX B - Computer Printout of Results
APPENDIX C - Laboratory Results
APPENDIX D - Field Data Sheets
APPENDIX E - Calibration Information
APPENDIX F - Strip Chart Data
APPENDIX G - Process Data
APPENDIX H - Permit to Operate



1. INTRODUCTION

Under the Bradley Landfill and Recycling Center (BLRC) site specific Rule 1150.1 compliance plan, Waste Management Recycling and Disposal Services of California, Inc. is required to conduct an annual source test on landfill gas Flare #1 located at BLRC (Permit to Construct #425253). Horizon Air Measurement Services, Inc. (Horizon) had been retained for this purpose.

All testing/analytical procedures conformed to those outlined in Horizon Test Plan No. W07-042-TP, which had been previously approved by the South Coast Air Quality Management District (SCAQMD). Horizon completed the source testing on April 20, 2005.

Two samples were taken for each parameter of interest (Table 1-1) with the exception of trace organic compounds and reduced sulfur compounds, for which only one sample per location was collected. The results of the testing program, with respect to Permit limits, are provided in Section 2 - Results Summary.

A brief description of the flare and flare operating conditions during testing is provided in Section 3. Section 4 provides a summary of sampling/analytical procedures utilized. Section 5 provides a more detailed results summary/discussion.



Table 1-1
Compounds of Interest - Flare #1
Waste Management - Bradley Landfill
April 20, 2005

Parameter	Location	Method	Number of Samples Per Source
Total Non Methane Hydrocarbons	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 25.3	2
Reduced Sulfur Compounds (C ₁ -C ₃) Including H ₂ S	Inlet	SCAQMD Method 307.91 Equivalent	1
Speciated Organic Compounds	Inlet	Whole Air/GC-MS (1150 list)	1
	Outlet	Whole Air/GC-MS (1150 list)	1
Particulate Matter	Outlet	SCAQMD Method 5.1	2
Oxides of Nitrogen	Outlet	SCAQMD Method 100.1	2
Carbon Monoxide	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 100.1	2
Oxygen	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 100.1	2
Carbon Dioxide	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 100.1	2
Methane	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 25.3	2
Flow Rate/Temperature	Inlet	SCAQMD Method 2.3	2
	Outlet	SCAQMD Method 5.1/Calculated	2
Moisture	Outlet	SCAQMD Method 5.1	2
	Inlet	SCAQMD Method 4.1	2
BTU Content	Inlet	SCAQMD Method 25.1	2



2. SUMMARY OF RESULTS

The results of the testing program conducted on Flare #1 are provided in Table 2-1. Emission rates of oxides of nitrogen, carbon monoxide, total particulate matter, total non-methane organics and total sulfur compounds (as SO₂) were within PTC 425253 (see Appendix H) limitations.

A more detailed discussion of results is provided in Section 5.

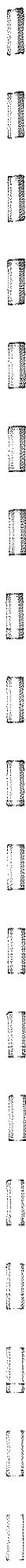


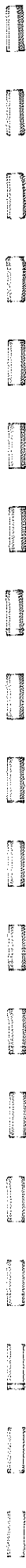
Table 2-1
Summary of Results
Flare #1
Waste Management - Bradley Landfill
April 20, 2005

Parameter	Measured Emission Rate*	Permitted Emission Rate
Oxides of Nitrogen, as NO ₂	4.80 lb/hr 0.029 lb/MMBtu	10.0 lb/hr, 0.06 lb/MMBtu
Total Particulate Matter	1.24 lb/hr	3.0 lb/hr
Carbon Monoxide	<5.6 lb/hr	33.3 lb/hr
Total Non Methane Organics, as CH ₄	0.379 lb/hr	1.86 lb/hr
Total Non Methane Organics, as C ₆	0.77 ppm C ₆ @ 3% O ₂	20 ppm C ₆ @ 3% O ₂ (Rule 1150.1)
Total Sulfur Compounds, as SO ₂	3.06 lb/hr	8.44 lb/hr

* Measured emission rates shown are the average of two test runs (samples).

** Based upon the facility landfill gas flow rate meter.

*** Measured using SCAQMD Method 2.3.



3. FLARE DESCRIPTION AND OPERATION

3.1 Flare Description

The landfill gas flare is a John Zink enclosed flare consisting of an insulated steel cylinder 60 feet high and 156 inches outside diameter (see Figure 3-1). The flare is equipped with a multi-jet burner, a propane gas pilot, electric igniter, UV flame sensor, thermocouple with temperature indicator and recorder, automatic shutdown and alarm system, automatic combustion air regulating system, temperature controller and flare arrestor. Landfill gas is supplied by a 200 horsepower (Hp) blower (one blower is standby). Landfill gas flow rate was continuously monitored using an annubar and is recorded digitally by the facility. Flare temperature and condensate injection rate was also continuously monitored by the facility.

Condensate flow rate is limited to five gallons per minute by the Permit.

3.2 Sample Location

Flare exhaust samples were obtained from each of two ports positioned at right angles, located five feet (0.4 diameters) from the top of the flare (144 inches inside diameter) and approximately 55 feet (4.6 diameters) above ground level.

Inlet samples and measured flow rate were obtained from the 14-inch diameter (13.25 inch inside diameter) landfill gas line supplying the flare at a location 144 inches (10.9 diameters) downstream and 93 inches (7.0 diameters) upstream of any flow disturbance.

3.3 Flare Operation During Testing

The following operating conditions were maintained during the emissions testing:

	<u>Run 1</u>	<u>Run 2</u>
Flare Temperature -	1676 °F	1670 °F
Landfill Gas Flow Rate -	5536 scfm	5461 scfm
Condensate Injection Rate -	3.4 gpm	3.0 gpm

Flare process data is provided in Appendix G.



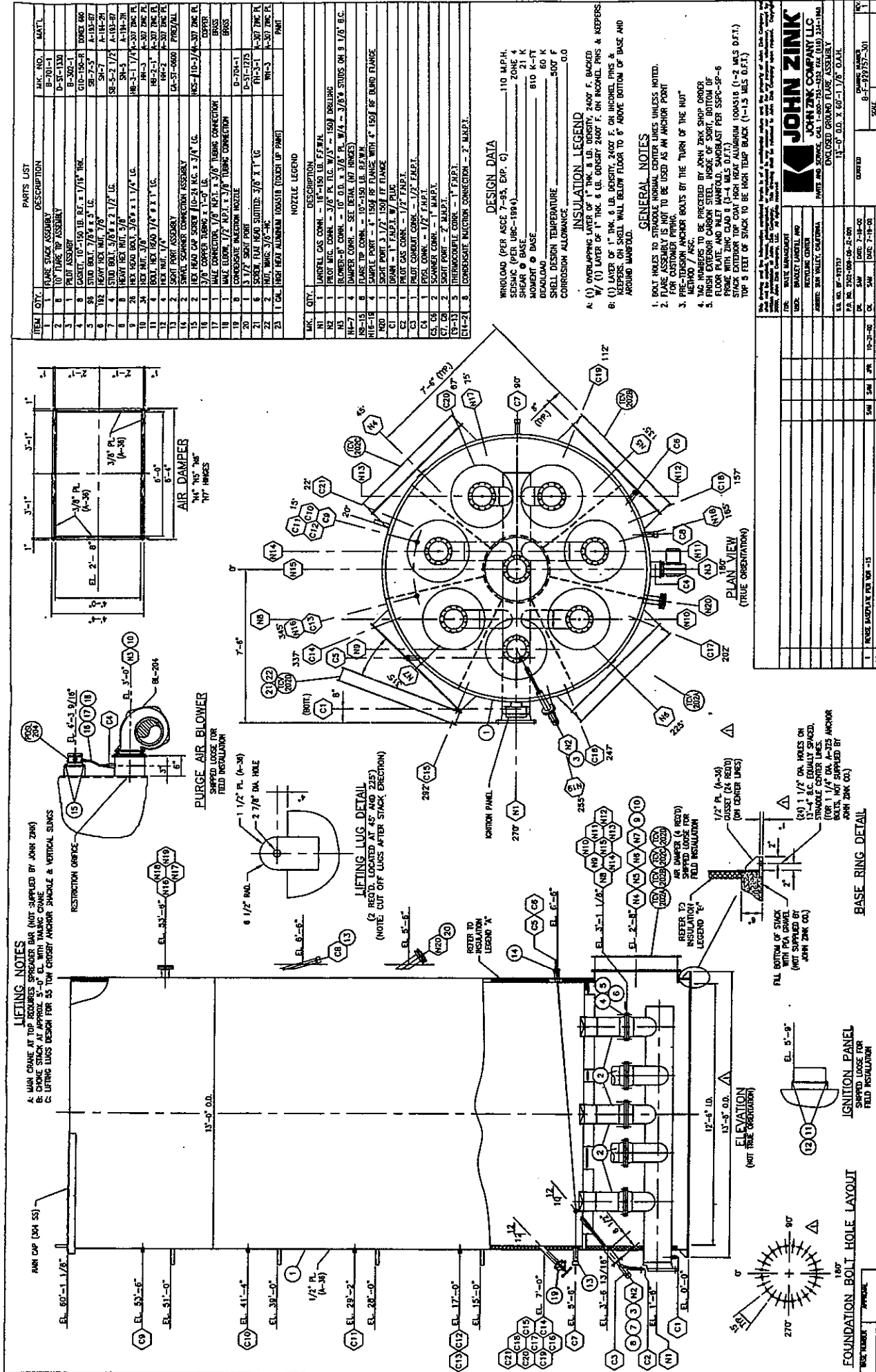
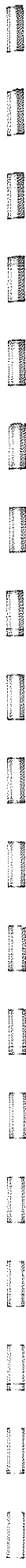


Figure 3-1



4. SAMPLING/ANALYSES

The sampling/analytical program had been designed to quantify the parameters of interest outlined in Table 1-1.

4.1 Sample Location

4.1.1 Flare Exhaust

At the flare exhaust 24 sample points (12 per diameter), determined in accordance with Method 1.1, were utilized for the determination of the following compounds:

- particulate matter
- NO_x
- CO
- O₂/CO₂
- flow rate
- moisture

The exact locations of the sampling points are provided in Appendix D, Field Data Sheets. A description of SCAQMD Method 1.1 is provided in Appendix A.

One sample point near the center of the stack was utilized for the collection of the following compounds:

- speciated organic compounds
- total non methane hydrocarbons
- methane



4.1.2 Landfill Gas Supply Line

Twelve sample points (six per diameter), determined in accordance with Method 1.1, were used for collection of the following parameter:

- flow rate

The exact locations of the sampling points are provided in Appendix D, Field Data Sheets. A description of SCAQMD Method 1.1 is provided in Appendix A.

A single sample point was utilized for the collection of the following compounds:

- total non methane hydrocarbons
- methane
- CO
- CO₂/O₂
- reduced sulfur compounds
- speciated organic compounds
- BTU content
- moisture

4.2 Moisture

4.2.1 Inlet - SCAQMD Method 4.1

Landfill gas moisture content was determined using SCAQMD Method 4.1. Two, one hour test runs were conducted in conjunction with the outlet particulate and SCAQMD Method 100 testing. A description of SCAQMD Method 4.1 is provided in Appendix A.



4.2.2 Outlet - SCAQMD Method 5.1

Moisture content of the flare exhaust was determined using SCAQMD Method 4.1 in conjunction with SCAQMD Method 5.1, as detailed in Appendix A.

4.3 Flow Rate

4.3.1 Inlet - SCAQMD Method 2.3

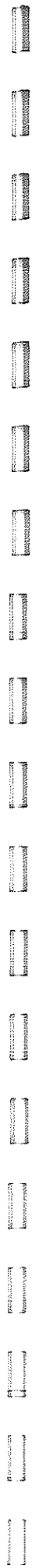
Landfill gas flow rate was determined using SCAQMD Method 2.3. A description of SCAQMD Method 2.3 is provided in Appendix A.

4.3.2 Outlet - SCAQMD Method 5.1

The landfill flare flow rate was monitored in conjunction with SCAQMD Method 5.1, as detailed in Appendix A. However, since the flare exhaust velocity was below the applicable limit (0.05 in. WG ΔP) of SCAQMD Method 2.1/5.1, the exhaust flow rate was calculated stoichiometrically based upon the landfill gas composition and stack dilution.

4.4 Particulate Matter (Outlet) - SCAQMD Method 5.1

Horizon conducted two, 60-minute test runs on the flare exhaust for particulate matter determination in accordance with SCAQMD Method 5.1 protocol. Twenty-four traverse points were utilized for the collection of particulate matter at the flare exhaust. A description of SCAQMD Method 5.1 is provided in Appendix A. Stack gases were withdrawn through an integral quartz nozzle and probe.



4.5 Oxides of Nitrogen, Carbon Dioxide, Oxygen (Continuous Emissions Monitoring) - SCAQMD Method 100.1

Two, 60-minute test runs were conducted at the flare exhaust. Twenty-four sample points were utilized. All sampling was performed under the guidelines of SCAQMD Method 100.1 as detailed in Appendix A.

4.6 Hydrogen Sulfide (H_2S), and C_1 - C_3 Sulfur Compounds (Inlet) - SCAQMD Method 307.91 Equivalent

Hydrogen sulfide and C_1 - C_3 sulfur compound samples were collected at the inlet of the flare using the Tedlar bag collection system depicted in Appendix A. All system components coming in contact with the landfill gas were Teflon.

Hydrogen sulfide and C_1 - C_3 sulfur compounds were analyzed using a Method 307.91 equivalent by AtmAA, Inc. Equivalency had been formally granted by SCAQMD to AtmAA, Inc. for this Method.

4.7 Speciated Organic Compounds - SCAQMD Rule 1150.1 List

4.7.1 Inlet

Speciated organic compounds were collected at the flare inlet of the landfill gas using the Tedlar bag collection system depicted in Appendix A. All system components coming in contact with the landfill gas were Teflon or stainless steel. Speciated organic compounds (SCAQMD Rule 1150.1 list) were identified and quantified using GC/MS analytical procedures.

4.7.2 Outlet

Speciated organic compound samples were collected in conjunction with the particulate/CEM testing at the outlet using the Tedlar bag method depicted in Appendix A. Each sample was then analyzed for speciated organic compounds (SCAQMD Rule 1150.1 list) using GC/MS procedures.



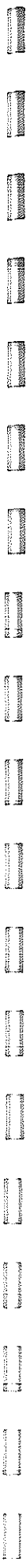
4.8 Total Non Methane Hydrocarbons, Methane, Carbon Dioxide and Carbon Monoxide

4.8.1 Inlet - SCAQMD Method 25.1

Total non methane hydrocarbons, methane, CO₂ and CO concentration were determined at the flare inlet from duplicate samples using SCAQMD Method 25.1. A description of SCAQMD Method 25.1 is provided in Appendix A.

4.8.2 Outlet - SCAQMD Method 25.3

Duplicate samples were obtained for total non methane hydrocarbon and methane concentration determination using SCAQMD Method 25.3. A description of SCAQMD Method 25.3 is provided in Appendix A.



5. RESULTS DISCUSSION

Detailed results of the criteria testing conducted on Flare #1 on April 20, 2005 are presented in Table 5-1. Speciated organic compound destruction efficiencies and emission rates are provided in Table 5-2. Since the flare exhaust velocity was below the applicable range ($> 0.05 \Delta P$ inches water gauge) of SCAQMD Method 2.1, the flare exhaust flow rate for each test run was calculated stoichiometrically based upon the composition of the landfill gas and the exhaust stack dilution. Oxide of sulfur emission rate was calculated based upon the landfill gas total sulfur compound concentration and flow rate (see Appendix B).



Table 5-1
Summary of Results
Waste Management - Bradley Landfill
Flare #1
April 20, 2005

	LANDFILL GAS			FLARE EXHAUST		
Run Number	1	2	Avg.	1	2	Avg.
STACK GAS CHARACTERISTICS						
Temperature, degrees F	131	145	138	1692	1698	1695
Moisture, %	8.9	7.3	8.1	11.1	9.9	10.5
Flow Rate, acfm	7438	7559	7498			
Flow Rate, dscfm	5940	5999	5969	60862	* 66578	* 63720
Fixed Gases						
Oxygen, %	1.77	-	1.77	11.80	12.50	12.15
Carbon Dioxide, %	36.20	-	36.20	8.40	7.79	8.10
Methane, %	45.80	-	45.80	0.00	0.00	0.00
BTU Value, Btu/scf	463	-	463	-	-	-
EMISSIONS						
Oxides of Nitrogen						
ppm	-	-	-	11.4	9.4	10.4
ppm @ 3 % O2	-	-	-	22.3	20.1	21.2
lb/hr	-	-	-	5.02	4.57	4.80
lb/MMBtu	-	-	-	0.031	0.027	0.029
Carbon Monoxide						
ppm	-	-	-	< 20.0	< 20.0	< 20.0
ppm @ 3 % O2	-	-	-	< 39.3	< 42.6	< 41.0
lb/hr	-	-	-	< 5.4	< 5.9	< 5.6
lb/MMBtu	-	-	-	< 0.033	< 0.035	< 0.034
Total Particulate Matter						
gr/dscf	-	-	-	0.00208	0.00245	0.00227
lb/hr	-	-	-	1.09	1.40	1.24
Total Non-Methane Hydrocarbons (Reactive Organic Compounds)						
ppm, as Methane	9355	-	9355	2.35	-	2.35
lb/hr, as Methane	141.1	-	141.1	0.379	-	0.379
Sulfur Compounds						
Hydrogen Sulfide, ppm	40.7	-	40.7	0.50	-	0.50
Total Sulfur, ppm as H2S	50.6	-	50.6	-	-	-
Oxides of Sulfur**						
lb/hr	-	-	-	3.06	-	3.06

* Flow Rate calculated stoichiometrically

** Calculated from sulfur balance



Table 5-2
Trace Organic Species
Destruction Efficiency Results
Waste Management - Bradley Landfill
Flare #1
April 20, 2005

Species	Inlet		Outlet		Destruction Efficiency (%)
	Concentration (ppb)	Emission Rate (lb/hr)	Concentration (ppb)	Emission Rate (lb/hr)	
Hydrogen Sulfide	40400	1.30E+00	< 500	< 1.72E-01	> 86.79
Benzene	2670	1.97E-01	1.5	1.18E-03	99.40
Benzylchloride	< 40	< 4.79E-03	< 0.8	< 1.02E-03	NA
Chlorobenzene	122	1.30E-02	< 0.3	< 3.41E-04	> 97.37
Dichlorobenzenes	815	1.13E-01	< 1.1	< 1.63E-03	> 98.56
1,1-dichloroethane	210	1.96E-02	< 0.3	< 2.99E-04	> 98.47
1,2-dichloroethane	67	6.29E-03	< 0.3	< 2.99E-04	> 95.24
1,1-dichloroethylene	63.8	5.84E-03	< 0.3	< 2.93E-04	> 94.98
Dichloromethane	692	5.55E-02	< 0.3	< 2.57E-04	> 99.54
1,2-dibromoethane	< 30	< 5.32E-03	< 0.3	< 5.68E-04	NA
Perchloroethene	1690	3.78E-01	< 0.1	< 4.77E-04	> 99.87
Carbon tetrachloride	< 30	< 4.36E-03	< 0.2	< 3.10E-04	NA
Toluene	29900	2.60E+00	0.36	3.34E-04	99.99
1,1,1-trichloroethane	20.0	2.51E-03	< 0.2	< 2.68E-04	> 89.32
Trichloroethene	620	7.66E-02	< 0.2	< 2.64E-04	> 99.66
Chloroform	< 20	< 2.25E-03	< 0.2	< 2.40E-04	NA
Vinyl Chloride	185	1.09E-02	< 0.2	< 1.26E-04	> 98.85
m xylenes	13000	1.30E+00	0.31	3.31E-04	99.97
o+p xylene	4420	4.42E-01	< 0.30	< 3.20E-04	> 99.93
TNMHC	9354784	1.41E+02	2351	3.79E-01	99.73

Note: All values preceded by "<" are below the detection limit - reported values are detection limit values.
 NA--Not applicable: Destruction efficiency cannot be calculated since both inlet and outlet values are below the detection limit.

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APPENDIX A - Sampling and Analytical Methods

Method: Stack Gas Velocity and Volumetric Flow Rate From Small Stacks or Ducts

Applicable for Methods: SCAQMD Method 2.3

Principle: The average gas velocity in a stack gas is determined from the gas density and from measurement of the average velocity head with a standard pitot tube.

Sampling Procedure: The velocity head and temperature is measured at the traverse points specified by SCAQMD Method 1.2. The static pressure in the stack and the atmospheric pressure is determined. The stack gas molecular weight is determined from independent measurements of O₂, CO₂ and H₂O concentrations.

Sample Recovery: and Analyses: The stack gas velocity is determined from the measured average velocity head, the measured dry concentrations of O₂ and CO₂ and the measured concentration of H₂O. The velocity is determined from the following set of equations:

Where,

ΔP = velocity head, inches in H₂O
 Ts = gas/temperature, degrees R
 Ps = absolute static pressure

Mwd = dry molecular weight
 Mw = molecular weight
 Cp = pitot flow coefficient

Dry molecular weight of stack gas

$$Mwd = 0.44 (\%CO_2) + 0.32 (\%O_2) + 0.28 (\%N_2 + \%CO)$$

Molecular weight of stack gas, wet basis

$$M_w = (M_{wd} \times M_d) + 18 (1 - M_d)$$

$$\text{Where, } M_d = \frac{100 - Bws}{100}$$

Stack gas velocity

$$(V_s)_{avg.} = (5130) C_p \times \sqrt{\Delta P_{avg.}} \times \sqrt{T_s} \times \left(\frac{1}{P_s \times M_w} \right)^{1/2}$$

Method:

Determination of Moisture in Stack Gases

Applicable for
Methods:

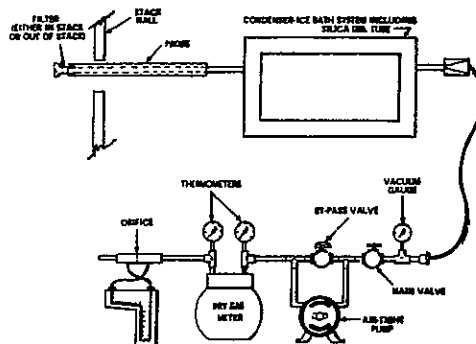
EPA Method 4, ARB 1-4, SCAQMD Method 4.1

Principle:

A gas sample is extracted at a constant rate from the source; moisture is removed from the stream and determined either volumetrically or gravimetrically.

Sampling Procedure:

Set up train as shown in the following figure. Sample is drawn at a constant rate through a sufficiently heated probe. The probe is connected to the impinger train by Teflon or glass tubing. The train consists of two greenburg smith impinger (SCAQMD 4.1) or one modified and 1 greenburg smith impinger (CARB & EPA) each containing 100 ml of water, an empty impinger as a knock-out and an impinger containing silica gel to protect the pump from moisture.



Sample Recovery:
and Analyses:

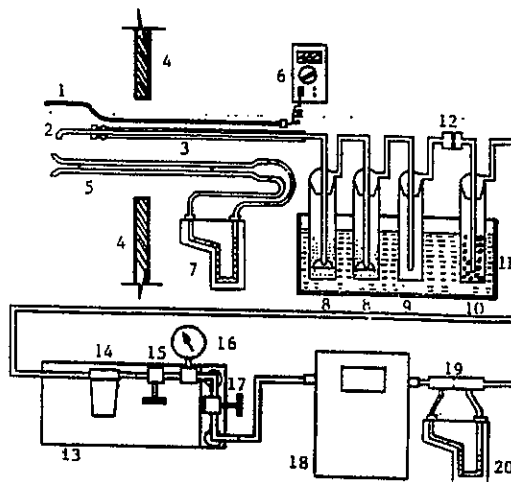
Following testing, moisture content is determined gravimetrically or volumetrically from initial and final impinger contents weights or volume.

Method: **Determination of Particulate Matter Emissions From Stationary Sources Using a Wet Impingement Train**

Reference: SCAQMD Method 5.1

Principle: Stack gas is withdrawn isokinetically from the source through a sample train. Particulate matter is collected in impingers containing deionized water and on a back-up filter. The impingers are contained in an ice bath to maintain a sampled gas temperature of approximately 15° C (60° F). The filter is not heated.

Sampling Procedure: The sampling train is shown in the figure below. The sample is drawn isokinetically through a glass or quartz probe (hi-temp). The probe is connected to an impinger train by Teflon tubing. The train consists of two Greenburg-Smith impingers which contain 100 ml of DI water; an empty impinger as a knock-out; and an impinger containing silica gel to protect the pump from moisture. Sample is withdrawn isokinetically from each predetermined sample point (determined using SCAQMD Method 1.1) through the sample train, which is followed by a vacuum line, a pump, a dry gas meter and a calibrated orifice.



- | | |
|--|---|
| 1. Temperature Sensor | 11. Ice Bath |
| 2. Nozzle | 12. Filter |
| 3. Glass Lined Stainless Steel Probe | 13. Sealed Pump (Leak Free) |
| 4. S-type Pitot Tube | 14. Filter for Pump |
| 5. Stack Wall | 15. Metering Valve |
| 6. Temperature Sensor Meter | 16. Vacuum Gauge |
| 7. Pitot Tube Inclined Manometer | 17. By-pass Valve |
| 8. Impinger with 100 ml H ₂ O | 18. Temperature Compensated Dry Gas Meter |
| 9. Empty Bubbler | 19. Orifice |
| 10. Bubbler with Silica Gel | |

Sample Recovery: The moisture content is determined either gravimetrically or volumetrically from initial and final impinger weights or volume. Then the filter, probe/impinger rinse (including nozzle rinse, liner rinse, impinger contents and rinses) and silica gel are recovered into Containers #1, #2 and #3, respectively.

Analytical Procedure: The aqueous sample is filtered through a tared fiberglass filter. An organic extraction is performed on the resulting solution using methylene chloride. Both the extraction filter and sample train filter are desiccated then measured gravimetrically. The organic extract and aqueous catch are evaporated, desiccated and measured gravimetrically.

If significant levels of sulfur compounds are present in the stack, each sample fraction is analyzed by acid-base titration for acid sulfate content and by barium-thorin titration for sulfate content.

Method: Carbon Monoxide by SCAQMD Micro Total Carbon Analyses

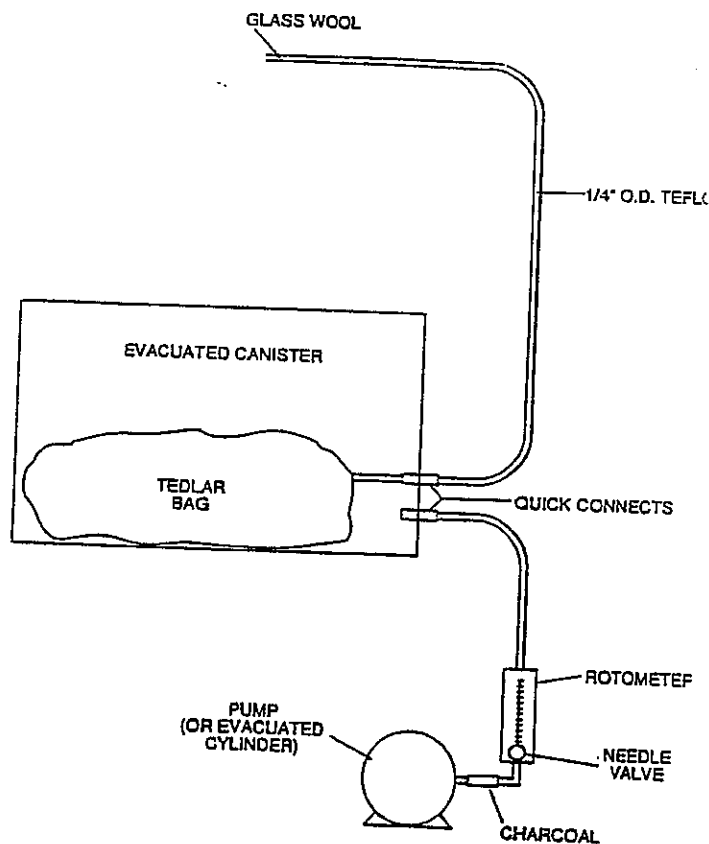
Reference: SCAQMD Method 10.1 (Tedlar Bag)

Principle: A Tedlar bag is filled with flue gas at a constant rate. The bag contents are analyzed by total combustion analyses/flame ionization detection for carbon monoxide.

Sampling Procedure: A gas sample is collected by evacuating the canister, see figure, at a constant rate over each test run using a rotameter/needle valve and a diaphragm pump. This causes the Tedlar bag to fill with stack gas at a constant rate while maintaining sample integrity.

Prior to each sampling run, the evacuated canister (containing the Tedlar bag) is leak checked at 2" Hg vacuum. The sample train upstream of the Tedlar bag is then purged with stack gas. At the conclusion of each test run, each Tedlar bag sample is sealed and stored in an opaque container pending analysis.

Analytical Procedure: Carbon monoxide concentration from the sample is determined using the SCAQMD Total Combustion Analysis (TCA) procedure.



Method:	Determination of Total Gaseous Non-Methane Organic Emissions as Carbon
Reference:	SCAQMD Method 25.1
Principle:	A sample of flue gas is drawn through a condensate trap and into an evacuated 12 liter tank. Volatile organic compounds (VOC), as total gaseous non-methane organics (TGNMO), are determined by combining results from independent analysis of condensate in the traps and gases in the tanks.
Sampling Procedure:	<p>Duplicate gas samples are withdrawn from a source at a constant rate through condensate traps immersed in dry ice followed by evacuated 12 liter (nominal) tanks. Heavy organic components condense as liquids and solids in the condensate traps. Lighter components pass as gases through the traps into the tanks. The combined results from tanks and trap analyses are used to determine a qualitative and quantitative expression of the effluent gas stream. Duplicate sampling is designed into the system to demonstrate precision.</p> <p>The sampling apparatus is checked for leaks prior to the sampling program by attaching the probe end to an absolute pressure gauge and vacuum pump in series. The sample lines were evacuated to less than 10 mm Hg and the gauge shutoff valve is then closed. The sample lines are deemed to be leak-free if no loss of vacuum occurs as indicated by the vacuum gauge. During sampling the tank pressures are monitored with a 0-30 inch vacuum gauge to ensure integrated sampling.</p> <p>The final vacuum of each sample is measured using a slack tube manometer. The sample is then pressurized to 800 mm Hg absolute with ultrapure nitrogen. Each sample is then analyzed using the SCAQMD TCA procedure for total non methane hydrocarbons.</p>
Analytical Procedure:	<p>Condensate traps are analyzed by first stripping carbon dioxide (CO₂) from the trap. The organic contents are then removed and oxidized to CO₂. This CO₂ is quantitatively collected in an evacuated vessel and measured by injection into a flame ionization detection/total combustion analysis (FID/TCA) system.</p> <p>The organic content of the sample fraction collected in each tank is measured by injecting a portion into the FID/TCA analysis system which uses a two phase gas chromatography (GC) column to separate carbon monoxide (CO), methane (CH₄) and carbon dioxide (CO₂) from each other and from the total gaseous non-methane organics (TGNMO) which are eluted as backflush. All eluted components are first oxidized to CO₂ by a hopcalite catalyst and then reduced to methane by a nickel catalyst. The resulting methane is detected using the flame ionization detector. A gas standard containing CO, CH₄, CO₂ and propane, traceable to NBS, is used to calibrated the FID/TCA analysis system.</p>

Method:

Determination of Total Gaseous Non-Methane Organic Emissions as Carbon
SCAQMD Method 25.3

Reference:

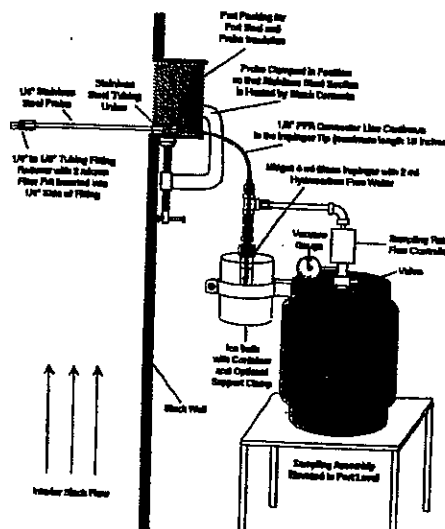
Principle:

A sample of flue gas is drawn through a condensate trap (mini-impinger) and into an evacuated six liter SUMMA canister. Volatile organic compounds (VOC), as total gaseous non-methane organics (TGNMO), are determined by combining results from independent analysis of condensate in the traps and gases in the SUMMA canisters.

Sampling Procedure:

Duplicate gas samples are withdrawn from a source at a constant rate through condensate traps immersed in an ice bath followed by evacuated six liter (nominal) SUMMA canisters. Heavy organic components condense as liquids and solids in the condensate traps. Lighter components pass as gases through the traps into the canisters. The combined results from canisters and mini-impinger analyses are used to determine a qualitative and quantitative expression of the effluent gas stream. Duplicate sampling is designed into the system to demonstrate precision.

The sampling apparatus is checked for leaks prior to the sampling program by capping the end of the sample probe. The sample flow valve is then opened and then closed to introduce vacuum to the system. The vacuum drop should then cease numerically above 10 in. Hg. A cease in movement of the vacuum gauge for a period of ten minutes indicates an acceptable leak check. When sampling is initiated, the vacuum gauge must indicate a canister vacuum of greater than 28 in. Hg. Immediately after sampling a post-test leak check is performed, followed by a rinse of the PFA line into the condensate trap with 0.5 to 1.0 ml of hydrocarbon free water.



Analytical Procedure:

Condensate traps are analyzed for total organic carbon by liquid injection into an infrared total organic carbon analyzer.

The organic content of the sample fraction collected in each canister is measured by injecting a portion into the FID/TCA analysis system which uses a two phase gas chromatography (GC) column to separate carbon monoxide (CO), methane (CH₄) and carbon dioxide (CO₂) from each other and from the total gaseous non-methane organics (TGNMO) which are eluted as backflush. All eluted components are first oxidized to CO₂ by a hopcalite catalyst and then reduced to methane by a nickel catalyst. The resulting methane is detected using the flame ionization detector. A gas standard containing CO, CH₄, CO₂ and propane, traceable to NBS, is used to calibrate the FID/TCA analysis system.

CONTINUOUS EMISSIONS MONITORING SYSTEM - TRUCK

SCAQMD Method 100.1

The continuous emissions monitoring system consists of a Thermo Electron Model 10AR chemiluminescence NO/NO_x analyzer, a Teledyne electro chemical O₂ analyzer, a Thermo Electron Model 48H CO gas filter correlation analyzer and a Horiba PIR 2000 non dispersive infrared CO₂ analyzer. All analyzer specifications are provided in Table 1. All concentrations are determined on a dry basis. Concentrations of NO_x, CO, O₂ and CO₂ are continuously recorded on a Linseis 10-inch strip chart recorder and a Strawberry Tree Data Acquisition System (DAS). The extractive monitoring system conforms with the requirements of SCAQMD Method 100.1.

The sampling probe (heated to 250°F), constructed of 1/2 inch-diameter 316 stainless steel, is connected to a condenser with a six foot length of 3/8 inch Teflon line (heated to 250°F). A Nupro stainless steel filter (10 micron) is connected at the tip of the probe and maintained at stack temperature.

The condenser consists of a series of two stainless steel moisture knock-out bottles immersed in an ice water bath. The system is designed to minimize contact between the sample and the condensate. Condensate is continuously removed from the knock-out bottles via a peristaltic pump. The condenser outlet temperature is monitored either manually at 10-minute intervals or on a strip chart recorder/DAS system. The sample exiting the condenser is then transported through a filter, housed in a stainless steel holder, followed by 3/8 inch O.D. Teflon tubing and a Teflon coated (or stainless steel/viton) diaphragm pump to the sample manifold. The sample manifold is constructed of stainless steel tubing and directs the sample through each of five rotameters to the NO_x monitor, O₂ monitor, CO monitor, CO₂ monitor and excess sample exhaust line, respectively. Sample flow through each channel is controlled by a back pressure regulator and by stainless steel needle valves on each rotameter. All components of the sampling system that contact the sample are composed of stainless steel, Teflon or glass.

The calibration system is comprised of two parts: the analyzer calibration and the system bias check. The calibration gases are, at a minimum, certified to $\pm 1\%$ by the manufacturer. Where necessary to comply with the reference method requirements, EPA Protocol 1 gases are used. The cylinders are equipped with pressure regulators which supply the calibration gas to the analyzers at the same pressure and flow rate as the sample. The selection of zero, span or sample gas directed to each analyzer is accomplished by operation of the zero, calibration or sample selector knobs located on the main flow control panel.

For SCAQMD Method 100.1 testing, the following procedures are conducted before and after each series of test runs:

Leak Check:

The leak check is performed by plugging the end of the sampling probe, evacuating the system to at least 20 inches of Hg. The leak check is deemed satisfactory if the system holds 20 inches of Hg vacuum for five minutes with less than one inch Hg loss.

Linearity Check:

The NO_x, CO, CO₂ and O₂ analyzers linearity check is performed by introducing, at a minimum, zero gas, mid range calibration gas (40-60% scale) and high range calibration gas (80-100% scale). Instrument span value is set on each instrument with the mid range gas. The high range calibration gas (80-100% scale) is then introduced into each instrument without any calibration adjustments. Linearity is confirmed, if all values agree with the calibration gas value to within 2% of the range.

Stratification Check:

A stack stratification check is performed (pre-test only) by traversing the stack with the appropriate number of traverse alternately with the reference point (center). If the gas composition is homogenous, < 10% variation between any traverse points in the gas stream and the normalized average point, single point gas sampling is performed at the reference point. If stratification exceeds the 10% criteria, then the stack cross section is traversed during sampling.

System Bias Check:

The system bias check is accomplished by transporting the same gases used to zero and span the analyzers to the sample system as close as practical to the probe inlet. This is accomplished by opening a valve located on the probe, allowing the gas to flow to the probe and back through the moisture knockout and sample line to the analyzers. During this check the system is operated at the normal sampling rate with no adjustments. The system bias check is considered valid if the difference between the gas concentration exhibited by the measurement system which a known concentration gas is introduced at the sampling probe tip and when the sample gas is introduced directly to the analyzer, does not exceed $\pm 5\%$ of the analyzer range.

Response Time:

Response time (upscale and downscale) for each analyzer is recorded during the system bias check. Upscale response time is defined as the time it takes the subject analyzer gas to reach 95% of the calibration gas value after introducing the upscale gas to the sample bias calibration system. Downscale response time is defined as the time it takes the subject analyzer to return to zero after the zero gas is introduced into the sample system bias calibration system.

NO_x Conversion Efficiency

The NO_x analyzer NO₂ conversion efficiency is determined by injecting a NO₂ gas standard directly into the NO_x analyzer (after initial calibration). The analyzer response must be at least 90% of the NO₂ standard gas value.

NO₂ Converter Efficiency (alternate method)

The mid level NO gas standard is directly injected into a clean leak-free Tedlar bag. The bag is then diluted 1:1 with air (20.9% O₂). The bag is immediately attached to the NO_x sample line. The initial NO_x concentration is recorded on the strip chart. After at least 30 minutes the Tedlar bag is reattached to the NO_x sample line. Analyzer response must be at 98% of the initial Tedlar bag NO_x value to be acceptable.

In between each sampling run the following procedures are conducted:

Zero and Calibration Drift Check:

Upon the completion of each test run, the zero and calibration drift check is performed by introducing zero and mid range calibration gases to the instruments, with no adjustments (with the exception of flow to instruments) after each test run. The analyzer response must be within $\pm 3\%$ of the actual calibration gas value.

Analyzer Calibration:

Upon completion of the drift test, the analyzer calibration is performed by introducing the zero and mid range gases to each analyzer prior to the upcoming test run and adjusting the instrument calibration as necessary.

System Bias Check

(same as above)

A schematic of the sample system and specific information of the analytical equipment is provided in the following pages.

TABLE 1

CONTINUOUS EMISSIONS MONITORING LABORATORY - TRUCK**NO_x CHEMILUMINESCENT ANALYZER -- THERMO ELECTRON MODEL 10 A**

Response Time (0-90%)	1.5 sec -- NO mode/1.7 sec -- NO _x mode
Zero Drift	Negligible after 1/2 hour warmup
Linearity	$\pm 1\%$ of full scale
Accuracy	Derived from the NO or NO ₂ calibration gas, $\pm 1\%$ of full scale
Operating Ranges (ppm)	2.5, 10, 25, 100, 250, 1000, 2500, 10000
Output	0-1 volt

O₂ ANALYZER, FUEL TYPE -- TELEDYNE MODEL 326RA

Response Time (0-90%)	60 seconds
Accuracy	$\pm 1\%$ of scale at constant temperature $\pm 1\%$ of scale of $\pm 5\%$ of reading, whichever is greater, over the operation temperature range.
Operating Ranges (%)	0-5, 0-25
Output	0-1 volt

O₂ ANALYZER, PARAMAGNETIC -- SERVOMEX MODEL 1400B

Response Time (0-90%)	15 seconds
Accuracy	0.1% oxygen
Linearity	$\pm 1\%$ scale
Operating Ranges (%)	0-25, 0-100
Output	0-1 volt

CO GAS FILTER CORRELATION -- THERMO ELECTRON MODEL 48H

Response Time (0-95%)	1 minute
Zero Drift	± 0.2 ppm CO
Span Drift	Less than 1% full scale in 24 hours
Linearity	$\pm 1\%$ full scale, all ranges
Accuracy	± 0.1 ppm CO
Operating Ranges (ppm)	50, 100, 250, 500, 1000, 2500, 5000, 10,000, 25,000, 50,000
Output	0-1 volt

TABLE 1 (Cont.)

CO₂ INFRARED GAS ANALYZER -- HORIBA - MODEL PIR 2000

Response Time (0-90%)	5 seconds
Zero Drift	$\pm 1\%$ of full scale in 24 hours
Span Drift	$\pm 1\%$ of full scale in 24 hours
Linearity	$\pm 2\%$ of full scale
Resolution	Less than 1% of full scale
Operating Ranges (%)	0-5, 0-15, 0-25
Output	0-1 volt

SO₂ PULSED FLOURESCENT - TECO - MODEL 43C-HL

Response Time	80 seconds
Zero Drift	$\pm 1\%$
Span Drift	$\pm 1\%$
Linearity	$\pm 1\%$
Resolution	$\pm 1\%$
Operating Ranges	5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000
Output	0-10 volt

RATFISCH FID TOTAL HYDROCARBON ANALYZER -- MODEL 55CA

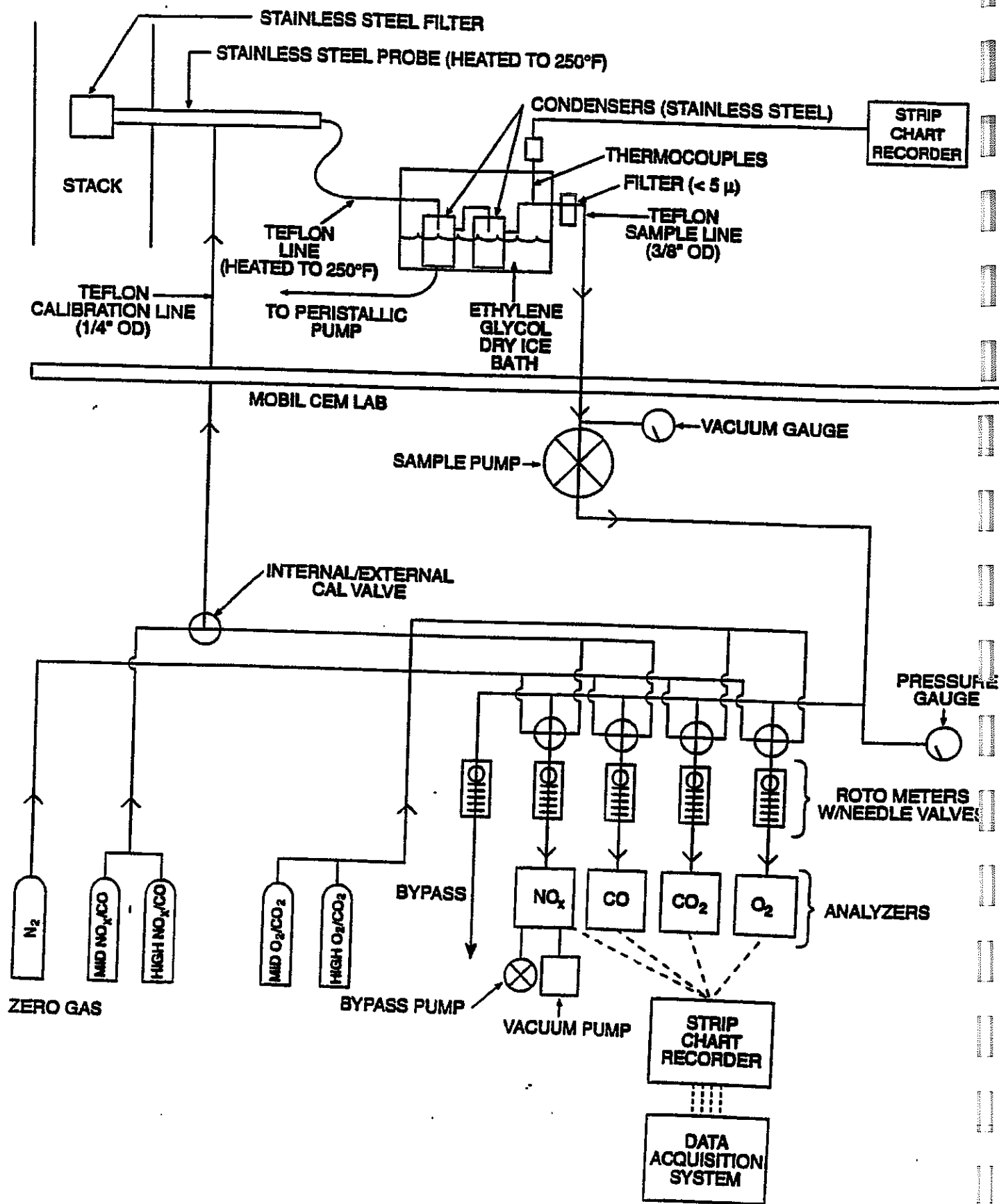
Response Time (0-90%)	5 seconds
Zero Drift	$\pm 1\%$ full scale in 24 hours
Span Drift	$\pm 1\%$ full scale in 24 hours
Linearity	$\pm 1\%$ full scale - constant
Accuracy	$\pm 1\%$ full scale at constant temp.
Operating Ranges (ppm)	10, 100, 1000, 10,000
Output	0 - 10 volts

LINSEIS MODEL L2045 FOUR PEN STRIP CHART RECORDER

Pen Speed	up to 120 cm/min
Measuring Response	0-20 volts
Linearity Error	0.25 %
Accuracy	0.3 %
Zero Suppression	Manual (from 1 to 10X full scale)

LINEAR 3 PEN CONTINUOUS -- MODEL 595 STRIP CHART

Pen Response	20 inches/second
Measuring Response	1 Mv through 5V
Zero Set	Electronically adjustable full scale with 1 full scale of zero suppression
Accuracy	Total limit of error $\pm 0.5\%$



Method:	NO/NO_x by Continuous Analyzer
Applicable Reference Methods:	EPA 7E, EPA 20; CARB 100, BAAQMD ST-13A, SCAQMD 100.1
Principle:	A sample is continuously withdrawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of NO or NO _x .
Analyzer:	TECO Model 10AR
Measurement Principle:	Chemiluminescence
Accuracy:	1% of full scale
Ranges:	0-2.5, 0-10, 0-25, 0-100, 0-250, 0-1000, 0-2500, 0-10,000 ppm
Output:	0-10 V
Inferences:	Compounds containing nitrogen (other than ammonia) may cause interference.
Response Time:	90%, 1.5 seconds (NO mode) and 1.7 seconds (NO _x mode)
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. If EPA Method 20 is used, that method's specific procedures for selecting sample points are used.
Analytical Procedure:	<p>The oxides of nitrogen monitoring instrument is a chemiluminescent nitric oxide analyzer. the operational basis of the instrument is the chemiluminescent reaction of NO and ozone (O₃) to form NO₂ in an excited state. Light emission results chemiluminescence is monitored through an optical filter by a high sensitivity photomultiplier tube, the output of which is electronically processed so it is linearly proportional to the NO concentration. The output of the instrument is in ppmV.</p> <p>When NO₂ is expected to be present in the flue gas, a supercooled water dropout flask will be placed in the sample line to avoid loss of NO₂. Since NO₂ is highly soluble in water, "freezing out" the water will allow the NO₂ to reach the analyzers for analysis. The analyzer measures NO only. In the NO_x mode, the gas is passed through a moly converter which converts NO₂ to NO and a total NO_x measurement is obtained. NO₂ is determined as the difference between NO and NO_x. Use of a moly converter instead of a stainless steel converter eliminates NH₃ interference; NH₃ is converted to NO with a stainless converter, but not with a moly converter.</p>

Method:	Oxygen (O ₂) by Continuous Analyzer
Applicable Reference Methods:	EPA 3A, EPA 20, CARB 100, BAAQMD ST-14, SCAQMD 100.1
Principle:	A sample is continuously withdrawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of O ₂ concentration.
Analyzer:	Teledyne Model 326R
Measurement Principle:	Electrochemical cell
Ranges:	0-5, 0-25% 0-100%
Accuracy:	1% of full scale
Output:	0-1 V
Interferences:	Halogens and halogenated compounds will cause a positive interference. Acid gases will consume the fuel cell and cause a slow calibration drift.
Response Time:	90% < 60 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. If Method 20 is used, that method's specific procedures for selecting sample points are used. Otherwise, stratification checks are performed at the start of a test program to select single or multiple-point sample locations.
Analytical Procedure:	An electrochemical cell is used to measure O ₂ concentration. Oxygen in the flue gas diffuses through a Teflon membrane and is reduced on the surface of the cathode. A corresponding oxidation occurs at the anode internally and an electric current is produced that is proportional to the concentration of oxygen. This current is measured and conditioned by the instrument's electronic circuitry to give an output in percent O ₂ by volume.

Method:	Carbon Dioxide (CO₂) by Continuous Analyzer
Applicable Reference	EPA 3A, CARB 100, BAAQMD ST-5, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of CO ₂ concentration.
Analyzer:	PIR 2000
Measurement Principle:	Non-dispersive infrared (NDIR)
Accuracy:	1% of full scale
Ranges:	0-5, 0-15%
Output:	0-1 V
Interferences:	A possible interference includes water. Since the instrument receives dried sample gas, this interference is not significant.
Response Time:	5 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously.
Analytical Procedure:	Carbon dioxide concentrations are measured by short path length non-dispersive infrared analyzers. These instruments measure the differential in infrared energy absorbed from energy beams passed through a reference cell (containing a gas selected to have minimal absorption of infrared energy in the wavelength absorbed by the gas component of interest) and a sample cell through which the sample gas flows continuously. The differential absorption appears as a reading on a scale of 0-100%.

Method:	Carbon Monoxide (CO) by NDIR/Gas Filter Correlation
Applicable Reference Methods:	EPA 6C; CARB 1-100; BAAQMD ST-6, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of CO concentration.
Analyzer:	TECO, Model 48H
Measurement Principle:	NDIR/Gas Filter Correlation
Precision:	0.1 % ppm
Ranges: ppm	0-50, 0-100, 0-250, 0-500, 0-1000, 0-2500, 0-5000, 0-10000, 0-2500, 0-3,000
Output:	0-1 V
Interferences:	Negligible interference from water and CO ₂
Rise/Fall times (0-95 %)	1 minute @ 1 lpm flow, 30 second integration time
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. Sample point selection has been described previously.
Analytical Procedure:	Radiation from an infrared source is chopped and then passed through a gas filter which alternates between CO and N ₂ due to rotation of a filter wheel. The radiation then passes through a narrow band-pass filter and a multiple optical pass sample cell where absorption by the sample gas occurs. The IR radiation exits the sample cell and falls on a solid state IR detector.

Method:	Sulfur Dioxide (SO₂) by Pulsed Fluorescent
Applicable Reference Methods:	EPA 10; CARB 1-100; BAAQMD ST-6, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of SO ₂ concentration.
Analyzer:	TECO, Model 43C-HL
Measurement Principle:	Pulsed fluorescence SO ₂ analyzer
Precision:	0.1% ppm
Ranges:	5, 10, 20, 50, 100, 200 ppm
Output:	0-10 V
Interferences:	Less than lower detectable limit except for the following: NO < 3 ppb, m-xylene < 2 ppm, H ₂ O < 2% of reading.
Response Time:	80 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. Sample point selection has been described previously.
Analytical Procedure:	The sample flows into the fluorescent chamber, where pulsating UV light excites the SO ₂ molecules. The condensing lens focuses the pulsating UV light into the mirror assembly. The mirror assembly contains four selecting mirrors that reflect only the wavelengths which excite SO ₂ molecules. As excited SO ₂ molecules decay to lower energy states they emit UV light that is proportional to the SO ₂ concentration. The PMT (photomultiplier tube) detects UV light emission from decaying SO ₂ molecules. The PMT continuously monitors pulsating UV light source and is connected to a circuit that compensates for fluctuating in the light.



AtmAA Inc.

23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

environmental consultants
laboratory services

Tandem Gas Chromatographic/Mass Spectroscopic-Electrolytic
Conductivity Detector (GC/MS-ELCD) Method for
Determination of Total Sulfur in Gas Samples

AtmAA, Inc.
03-060

3/30/93

This method measures selected reduced sulfur species, including but not limited to hydrogen sulfide, carbonyl sulfide, methyl mercaptan, ethyl mercaptan, dimethyl sulfide, carbon disulfide, isopropyl mercaptan, n-propyl mercaptan, and dimethyl disulfide in gaseous sample matrices using gas chromatographic separation and a mass spectrometric and electrolytic conductivity detector (ELCD), where the ELCD measures hydrogen sulfide only. A non-polar methyl silicon capillary gas chromatographic column is used for component separation and selected ion monitoring is used for component quantification. Component quantification is obtained using a multi-component external standard prepared by Scott Specialty Gases. The lower detection limit varies by component but is at least 0.1 ppmv ethyl mercaptan (component of lowest sensitivity) for a 0.31 ml sample volume injection. The upper quantitation limit has not been determined but is at least beyond 80 ppmv dimethyl disulfide, for which response remained linear from 0.1 ppmv to 80 ppmv.

Hydrogen sulfide is measured using an electrolytic conductivity detector operated in the oxidative sulfur mode. A Chromosil 310 column, operated isothermally at 45°C. is used to separate H₂S from other sulfur components. A fixed volume loop injection is used in the analysis for H₂S.

Lower Detection Limits (LDL's):

Using a 1 ml injection volume for H₂S by electrolytic conductivity detector and 0.40 ml injection volume for GC/MS measured sulfur compounds, the following LDL's are obtained:

	(ppmv)
Hydrogen sulfide	0.5
Carbonyl sulfide	0.03
Methyl mercaptan	0.03
Ethyl mercaptan	0.04
Dimethyl sulfide	0.02
Carbon disulfide	0.02
i-propyl mercaptan	0.03
n-propyl mercaptan	0.03
Dimethyl disulfide	0.02

Equipment:

A Hewlett-Packard 5890 series II gas chromatograph (GC), Hewlett-Packard 5971A Mass Selective Detector, 486 MS/DOS computer and HP operating software are used for all sulfur species except H₂S. The GC is fitted with a heated 6-port Valco 1/16" line, sample injection valve. All gas transfer lines to the sample loop are fused silica lined Restek tubing. The fixed volume (0.40 ml) sample loop is Teflon. The transfer line from the valve to the GC column is cleaned and treated blank 0.53 mm OD fused silica line with polyimide coating.

H₂S is measured using a Varian 1400 GC with the Hall oxidative quartz tube furnace and electrolytic cell attached. Nitrogen is used as carrier and oxygen is used as the combustion gas.

Multi-component gaseous standards are prepared by Scott Specialty Gas and are contained in two separate aluminum cylinders and a Scotty IV canister as follows:

Cylinder A (CAL12250)

Carbonyl sulfide	15.2 ppmv
Ethyl mercaptan	13.4 ppmv
Carbon disulfide	16.1 ppmv

Cylinder B (CAL3563)

Hydrogen sulfide	12.3 ppmv
Methyl mercaptan	22.6 ppmv
Dimethyl sulfide	20.3 ppmv
Dimethyl disulfide	

Scotty IV (mix 252)

Hydrogen Sulfide 93.8 ppmv

Gas tight clean glass volumetric syringes of 10, 20, & 50 ml capacity, with smooth glass barrel (not sintered glass) are used to make volumetric dilutions of sample or standard.

GC/MS SIM parameters:

	Dwell per ion	start time	Ions
Group 1:	75 msec.	8.0 min.	60
Group 2:	75 msec.	10.0 min.	47,48,64
Group 3:	75 msec.	14.5 min.	47,62,76,78,43,61
Group 4:	75 msec.	19.5 min.	79,94,122,142,156, 128

Components monitored:

Group 1:	carbonyl sulfide
Group 2:	methyl mercaptan
Group 3:	ethyl mercaptan, dimethyl disulfide , carbon disulfide, isopropyl mercaptan, n-propyl mercaptan
Group 4:	dimethyl sulfide



Component	Quantitation ion	Confirmation ion
carbonyl sulfide	60	none
methyl mercaptan	47	48
ethyl mercaptan	62	47
dimethyl sulfide	62	47
carbon disulfide	76	78
iso-propyl mercaptan	76	43,47,61
n-propyl mercaptan	76	43,47,61
dimethyl disulfide	94	79

Sulfur dioxide is analyzed by monitoring mass 64 which is included in Group 2 ions.

Calibration:

Gaseous standards can be analyzed prior to or after a set of samples. Response factors are determined from a single point standard calibration. Multi-point calibrations are performed to verify linearity. Consistency of standard response with continuing calibrations is observed to indicate performance of multi-point calibration.

Samples containing components at less than the stated LDL can be analyzed by cryogenically focusing a measured volume of gaseous sample onto a glass bead filled Teflon loop immersed in liquid argon. The sample is thermally transferred upon injection by immersing the sample loop in near boiling temperature water. The LDL obtained by this technique is calculated as:

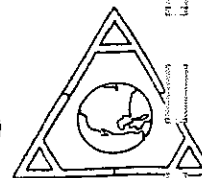
$$LDL_{cryo} = (cryo\ volume/0.40) * LDL_{0.40}$$

Acceptable volumes for cryogenic concentration range from 3 to 100 ml. and are determined based on amounts of other components in the sample such as water, carbon dioxide or hydrocarbons.

Procedure:

A volumetric sample of landfill or source collected gas is transferred from a Tedlar[®] bag to the 6-port valve injection line using a glass syringe of approximately 10 ml. A Teflon loop of 0.40 ml volume is used to inject the sample. When sample concentrations exceed that of the standard, appropriate volumetric sample dilutions are made using the glass syringes with dry nitrogen diluent. Immediately after sample injection, the GC/MS is started. Standards are analyzed in the same manner as samples. Appropriate component peaks are monitored and integrated after sample analysis data set has been obtained.

Hydrogen sulfide is measured using the electrolytic conductivity detector by a separate direct fixed loop valve injection using heated Teflon loop, transfer lines, and Teflon Chromosil 310 GC column.



A response factor for a standard component is calculated as:

$$rf = \text{std. amt.} / \text{std. area}$$

Sample concentration is calculated using the response factor:

$$\text{conc.} = rf \times \text{sample area}$$

At least 10% of samples in a sample set, or minimum of one sample per set are analyzed twice to determine precision. A separate report showing repeat analyses results is included with an analytical report of sulfur component concentrations per each sample set. Repeat analyses must agree within +/- 10% except for component concentrations less than 1 ppmv. A nitrogen blank is analyzed between standards and samples to verify that there is no component carry-over. Samples are analyzed as soon after they are received as possible, preferably same day and within four hours of collection. Data is being gathered to determine stability of sulfur compounds in Tedlar[®] bag containers in an effort to extend sample holding time. Samples are usually analyzed before standards to prevent carry-over, since most sulfur components measured in landfill gas samples are lower in concentration than those in the standards.

GC/MS Analysis Conditions:

GC conditions: a 30 M x 0.2 mm, 0.50 um film methyl silicon PONA column from Hewlett-Packard is temperature programmed as follows:

-65 degrees C, hold min.

15 degrees C min. to 220 degrees C, hold 5 min.

Valve oven Temp. 150 degrees C

GC/MS transfer line 180 degrees C

Carrier gas is helium, pressure regulated at 21 psi.

MS Conditions:

MS calibration is performed periodically prior to performing analyses using PFTBA (perfluoro-tributylamine) as supplied by Hewlett-Packard and as controlled by HP software under the mid-range auto tune program.
Solvent delay = 8 min.

Hall Detector/GC Analysis Conditions:

6' x 1/8" Teflon, Chromosil 310 analytical column

45 degrees C, isothermal

Valve oven & transfer line Temp. 105 degrees C.

Carrier gas is nitrogen, flow rate 18 cc/min.

Oxygen oxidation gas, flow rate 18 cc/min.

Quartz tube oxidation oven Temp. 650 degrees C.



APPENDIX B - Computer Printout of Results

SCAQMD Method 100.1 Emission Rates

Facility: Bradley Landfill
Source: Flare #1
Job No.: W07-042
Date: 4/20/2005

Run Number	*****	1	2
Load	*****	as Found	as Found
EPA F-Factor	dscf/MMBtu	9657	9657
Stack Flow Rate	dscfm	60862	66578
Oxygen	%	11.80	12.50
Carbon Dioxide	%	8.40	7.79

Oxides of Nitrogen

Concentration	ppm	11.4	9.4
Concentration @ 3 % O2	ppm	22.3	20.1
Concentration	lb/dscf	1.38E-06	1.14E-06
Emission Rate	lb/MMBtu	3.05E-02	2.75E-02
Emission Rate	lb/hr	5.023	4.570

Carbon Monoxide

Concentration	ppm	20.0	20.0
Concentration @ 3 % O2	ppm	39.3	42.6
Concentration	lb/dscf	1.48E-06	1.48E-06
Emission Rate	lb/MMBtu	3.27E-02	3.55E-02
Emission Rate	lb/hr	5.4	5.9

SCAQMD Method 5.1 Particulate Emissions

Facility: Bradley Landfill
Source: Flare #1
Job No.: W07-042
Date: 4/20/2005

STANDARD TEMPERATURE	Degrees F	60				
RUN NUMBER	*****	1	2	1	2	
DATE OF RUN	*****	04/20/04	04/23/03	04/20/04	04/23/03	
CLOCK TIME: INITIAL	*****	1348	1600	1348	1600	
CLOCK TIME: FINAL	*****	1525	1710	1525	1710	
AVG. STACK TEMPERATURE	Degrees F	1692	1698			
AVG. SQUARE DELTA P	Inches H2O	0.1000	0.1000			
NOZZLE DIAMETER	Inches	1.020	1.020			
BAROMETRIC PRESSURE	Inches HG	29.07	29.07			
SAMPLING TIME	Minutes	60	60			
SAMPLE VOLUME	Cubic Feet	54.052	53.262			
AVG. METER TEMP.	Degrees F	86.6	92.5			
AVG. DELTA H	Inches H2O	2.20	2.10			
DGM CALIB. FACTOR [Y]	*****	1.0015	1.0015			
WATER COLLECTED	Milliliters	133	114			
CO 2	Percent	8.40	7.79			
O 2	Percent	11.80	12.50			
CO	Percent					
CH4	Percent					
N 2	Percent	79.80	79.71			
STACK AREA	Square Inches	16286.0	16286.0			
STATIC PRESSURE	Inches WG.	-0.005	-0.005			
PITOT COEFFICIENT	*****	0.84	0.84			
SAMPLE VOLUME DRY	DSCF	50.32	49.04			
WATER AT STD.	SCF	6.3	5.4			
MOISTURE	Percent	11.1	9.9			
MOLE FRACTION DRY GAS	*****	0.89	0.90			
MOLECULAR WT.DRY	lb/lb Mole	29.82	29.75			
EXCESS AIR	Percent	127	146			
MOLECULAR WT. WET	lb/lb Mole	28.51	28.59			
STACK GAS PRESSURE	Inches HG	29.07	29.07			
STACK VELOCITY	AFPM	694	694			
VOLUMETRIC FLOWRATE, DRY STD.	DSCFM	16394	16572	60862	*	66578 *
VOLUMETRIC FLOWRATE, ACTUAL	ACFM	78540	78529			
ISOKINETIC RATIO	Percent	100	97			

CALCULATIONS FOR GRAIN LOADING AND EMISSION RATES

TOTAL PARTICULATE	mg	6.8	7.8	6.8	7.8
PARTICULATE CONCENTRATION	gr/dscf	0.0021	0.0024	0.0021	0.0024
PARTICULATE EMISSION RATE	lb/hr	0.29	0.35	1.09	1.40

*Denotes the use of calculated flowrate based on expansion factor of LFG.

SCAQMD Method 307.91

Facility: Bradley Landfill
 Source: Flare #1
 Job No.: W07-042
 Date: 4/20/2005

Sulfur Compounds

Speciated Compound	Concentration ppm, as H2S	No. of S molecules in Compound	Total S ppm, as H2S	SO2 Conc. mg/dscf	Avg. Inlet Flow Rate dscfm	SO2 Rate lb/hr
Hydrogen Sulfide	40.7	1	40.70	3.116	5969	2.461
Carbonyl Sulfide	0.27	1	0.27	0.021	5969	0.016
Methyl mercaptan	3.05	1	3.05	0.234	5969	0.184
Ethyl mercaptan	< 0.10	1	0.10	0.008	5969	0.006
Dimethyl sulfide	5.34	1	5.34	0.409	5969	0.323
Carbon disulfide	0.12	2	0.24	0.018	5969	0.015
Dimethyl disulfide	0.290	2	0.58	0.044	5969	0.035
iso-propyl mercaptan	0.24	1	0.24	0.018	5969	0.015
n-propyl mercaptan	< 0.06	1	0.06	0.005	5969	0.004
Total			50.58			3.06

SCAQMD Method 25.1 Analysis

Facility: Bradley Landfill
Source: Flare #1
Job No.: W07-042
Date: 4/20/2005

TOTAL COMBUSTION ANALYSIS RESULTS

Sample ID Run Number	Inlet 1A	Inlet 1B	Average
Methane in Tank	458000	458000	458000
TNMHC, Tank (Noncond.)	1000	880	
TNMHC - Condensables	7967.7	8861.5	
TNMHC - Total	8967.8	9741.8	
CO Concentration (ppm)	40.8	36.5	38.7
CO2 Concentration (ppm)	360000	364000	362000
O2 Concentration (%)	1.84	1.69	1.77
Sample Parameters			
Tank Number	R	S	
Trap Number	R	Q	
Sample Tank Volume (l)	12.202	12.051	
Initial Pressure (Torr)	2.5	2.5	
Initial Temperature (deg. K)	292	292	
Final Pressure (mm Hg)	306	327	
Final Temperature (deg. K)	292	292	
Sample Volume (l)	4.89	5.17	
Analysis Pressure (mm Hg)	820	820	
Analysis Temperature (deg. K)	292	292	
ICV Volume (l)	2.266	2.266	
ICV Final Pressure (mm Hg)	800	800	
ICV Final Temperature (deg. K)	292	292	
CO2 in ICV (ppm)	17200	20200	
TNMHC, Trap (Condensables)	7968	8861	
Stack Total TNMHC	8968	9742	9355

NOTE: All hydrocarbon values are in terms of ppm, v/v, as methane.

SCAQMD Methods 1-4 Flowrate Determination

Facility: Bradley Landfill
Source: Flare #1
Job No.: W07-042
Date: 4/20/2005

STANDARD TEMPERATURE	Degrees F	60		
RUN NUMBER	*****	1	2	Average
CLOCK TIME: INITIAL	*****	1348	1400	
CLOCK TIME: FINAL	*****	1448	1500	
AVG. STACK TEMPERATURE	Degrees F	131	145	138
AVG. SQUARE DELTA P	Inches H2O	1.7992	1.8125	1.8058
BAROMETRIC PRESSURE	Inches HG	29.07	29.07	29.07
SAMPLING TIME	Minutes	60	60	60
SAMPLE VOLUME	Cubic Feet	57.794	47.674	52.734
AVG. METER TEMP.	Degrees F	87.6	93.0	90.3
AVG. DELTA H	Inches H2O	1.60	1.60	1.60
DGM CALIB. FACTOR [Y]	*****	1.0110	1.0110	1.0110
WATER COLLECTED	Milliliters	112	74	93
CO 2	Percent	36.2	36.2	36.2
O 2	Percent	1.8	1.8	1.8
CO	Percent			
CH4	Percent	45.8	45.8	45.8
N 2	Percent	16.2	16.2	16.2
STACK AREA	Square Inches	137.9	137.9	137.9
STATIC PRESSURE	Inches WG	10.00	10.00	10.00
PITOT COEFFICIENT	*****	0.99	0.99	0.99
SAMPLE VOLUME DRY	DSCF	54.13	44.21	49.17
WATER AT STD.	SCF	5.3	3.5	4.4
MOISTURE	Percent	8.9	7.3	8.1
MOLE FRACTION DRY GAS	*****	0.91	0.93	0.92
MOLECULAR WT.DRY	lb/lb Mole	28.37	28.37	28.37
EXCESS AIR	Percent	70	70	70
MOLECULAR WT. WET	lb/lb Mole	27.45	27.61	27.53
STACK GAS PRESSURE	Inches HG	29.81	29.81	29.81
STACK VELOCITY	AFPM	7767	7893	7830
VOLUMETRIC FLOWRATE, DRY STD.	DSCFM	5940	5999	5969
VOLUMETRIC FLOWRATE, ACTUAL	ACFM	7438	7559	7498

EMISSION RATES

SAMPLE A				
TNMHC Concentration, as CH4	ppm	8968		8968
TNMHC Concentration, as CH4	mg/dscf	171		171
TNMHC Emission Rate, as CH4	lb/hr	134.6		135.3
SAMPLE B				
TNMHC Concentration, as CH4	ppm	9742		9742
TNMHC Concentration, as CH4	mg/dscf	186		186
TNMHC Emission Rate, as CH4	lb/hr	146.3		147.0
AVERAGE				
TNMHC Concentration, as CH4	ppm	9355		9355
TNMHC Concentration, as CH4	mg/dscf	179		179
TNMHC Emission Rate, as CH4	lb/hr	140.4		141.1

EXPANSION AND F-FACTOR CALC. METHOD

Client: Bradley Landfill
 Location: Sun Valley, CA
 Unit: Flare #1

Date: 4/20/2005
 Job #: W07-042
 Run#: 1

Fuel temperature _____ deg. F Std. Temp. 60 deg. F
 Fuel Pressure _____ psi
 Fuel Flow Rate _____ cfm Fuel Flow 5940 dscfm
 Exhaust Outlet O2 11.80 %
 Barometric Pressure 29.07

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		<u>1.77</u>			0.018
Nitrogen		<u>16.24</u>			0.162
Carbon Dioxide		<u>36.20</u>			0.362
Methane		<u>45.80</u>	462.58	416.51	3.925
Ethane	C2		0.00	0.00	0.000
Propane	C3		0.00	0.00	0.000
Iso-Butane	C4		0.00	0.00	0.000
N-Butane			0.00	0.00	0.000
Iso-Pentane	C5		0.00	0.00	0.000
N-Pentane			0.00	0.00	0.000
Hexane	C6		0.00	0.00	0.000
Heptane	C7		0.00	0.00	0.000
Octane	C8		0.00	0.00	0.000
Nonane	C9		0.00	0.00	0.000
Total		100.00	462.58	416.51	4.47

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92(20.92-%O2)

60862 DSCFM

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

9657 dscf/Mmbtu

EXPANSION AND F-FACTOR CALC. METHOD

Client: Bradley Landfill
 Location: Sun Valley, CA
 Unit: Flare #1

Date: 4/20/2005
 Job #: W07-042
 Run#: 2

Fuel temperature _____ deg. F Std. Temp. 60 deg. F
 Fuel Pressure _____ psi
 Fuel Flow Rate _____ cfm
 Exhaust Outlet O2 12.50 % Fuel Flow 5999 dscfm
 Barometric Pressure 29.07

COMPONENTS	MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen	<u>1.77</u>			0.018
Nitrogen	<u>16.24</u>			0.162
Carbon Dioxide	<u>36.20</u>			0.362
Methane	<u>45.80</u>	462.58	416.51	3.925
Ethane C2		0.00	0.00	0.000
Propane C3		0.00	0.00	0.000
Iso-Butane C4		0.00	0.00	0.000
N-Butane		0.00	0.00	0.000
Iso-Pentane C5		0.00	0.00	0.000
N-Pentane		0.00	0.00	0.000
Hexane C6		0.00	0.00	0.000
Heptane C7		0.00	0.00	0.000
Octane C8		0.00	0.00	0.000
Nonane C9		0.00	0.00	0.000
Total	100.00	462.58	416.51	4.47

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92/(20.92-%O2))

66578 DSCFM

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

9657 dscf/MMbtu

Facility: Bradley Landfill
Source: Flare #1
Job No.: W07-042
Date: 04/20/05

Run No.: 1
Fuel: LFG
Std. O2: 15

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25	20	25	100
Span:	12.05	6.99	13.00	50.80
Low:				
High:	20.01	12.01	20.00	80.20

**** POST-TEST DRIFT (DIRECT)****

Values

Zero:

Span:

0.00	0.00	0.00	0.00
11.88	6.80	13.13	50.20

Percent Drift

Zero:

Span:

0.00	0.00	0.00	0.00
-0.68	-0.95	0.50	-0.60

**** PRE-TEST BIAS ****

Values

Zero:

Span:

0.00	-0.20	0.00	0.00
12.00	6.90	13.13	50.00

**** POST-TEST BIAS ****

Values

Zero:

Span:

0.00	0.00	0.00	0.00
11.88	6.80	13.13	50.20

**** BIAS CORRECTION ****

Zero Average

Span Average

0.00	-0.10	0.00	0.00
11.94	6.85	13.13	50.10

**** POST-TEST DRIFT (BIAS)****

Percent Drift

Zero:

Span:

0.00	-1.00	0.00	0.00
0.48	0.50	0.00	-0.20

Bias-Corrected Concentration

Bias-Corrected Conc.(O2 adjusted)

11.80	8.40	11.35	8.73
		7.36	5.66

**** RAW AVERAGE CONCENTRATION ****

Average:		11.69	8.25	11.46	8.61	
O2 adjust:	15.0			7.34	5.52	
Date	Time	O2	CO2	NOx	CO	
20-Apr-05	1348	12.39	7.83	11.08	15.46	Port A
20-Apr-05	1349	12.04	7.78	10.86	11.29	
20-Apr-05	1350	12.18	7.82	10.82	12.65	
20-Apr-05	1351	12.11	7.98	11.20	11.36	
20-Apr-05	1352	11.68	8.21	12.17	9.23	
20-Apr-05	1353	11.61	8.47	12.62	5.94	
20-Apr-05	1354	11.73	7.96	11.03	5.46	
20-Apr-05	1355	12.35	7.69	10.39	9.99	
20-Apr-05	1356	12.97	6.85	7.97	18.02	
20-Apr-05	1357	13.01	7.05	8.27	31.89	
20-Apr-05	1358	12.54	7.68	9.91	30.71	
20-Apr-05	1359	12.28	7.59	9.97	14.17	
20-Apr-05	1400	12.60	7.49	9.78	17.75	
20-Apr-05	1401	12.48	7.59	10.11	22.83	
20-Apr-05	1402	12.11	7.88	11.13	17.72	
20-Apr-05	1403	12.17	7.83	10.91	19.69	
20-Apr-05	1404	11.59	8.43	12.71	17.17	
20-Apr-05	1405	11.21	8.76	13.29	4.94	
20-Apr-05	1406	10.89	8.90	13.61	2.91	
20-Apr-05	1407	11.38	8.65	12.94	3.68	
20-Apr-05	1408	11.13	8.82	13.44	4.65	
20-Apr-05	1409	11.03	8.82	13.23	4.02	
20-Apr-05	1410	11.09	8.82	13.32	4.16	
20-Apr-05	1411	11.26	8.51	12.68	4.29	
20-Apr-05	1412	11.21	8.60	12.77	5.06	
20-Apr-05	1413	11.60	8.34	12.19	6.68	
20-Apr-05	1414	11.53	8.44	12.36	6.53	
20-Apr-05	1415	11.71	8.17	11.90	6.35	
20-Apr-05	1416	11.65	8.26	12.41	7.71	
20-Apr-05	1417	11.89	8.19	11.68	10.21	
20-Apr-05	1418	11.44	8.54	13.21	8.48	
20-Apr-05	1455	11.68	8.05	10.11	2.53	Port B
20-Apr-05	1456	12.17	7.74	8.87	6.42	
20-Apr-05	1457	11.84	8.12	9.55	9.14	
20-Apr-05	1458	12.22	7.67	8.45	11.22	
20-Apr-05	1459	12.05	8.13	9.41	15.14	
20-Apr-05	1500	11.00	8.99	11.62	8.08	
20-Apr-05	1501	11.25	8.57	10.65	5.36	
20-Apr-05	1502	11.55	8.34	10.00	6.06	
20-Apr-05	1503	11.90	7.93	9.17	7.81	

20-Apr-05	1504	11.44	8.76	10.92	9.99
20-Apr-05	1505	11.42	8.11	9.94	5.44
20-Apr-05	1506	11.92	7.99	9.53	13.56
20-Apr-05	1507	12.27	7.73	9.29	14.60
20-Apr-05	1508	12.10	7.86	10.49	17.16
20-Apr-05	1509	11.42	8.81	12.80	16.61
20-Apr-05	1510	11.27	8.43	12.10	2.78
20-Apr-05	1511	11.86	7.95	10.64	2.27
20-Apr-05	1512	11.62	8.57	12.00	2.16
20-Apr-05	1513	11.37	8.51	12.49	1.65
20-Apr-05	1514	11.46	8.45	12.38	2.40
20-Apr-05	1515	11.37	8.61	12.59	2.20
20-Apr-05	1516	11.25	8.81	12.97	1.86
20-Apr-05	1517	11.34	8.44	12.41	1.98
20-Apr-05	1518	11.38	8.52	12.29	2.19
20-Apr-05	1519	11.37	8.63	12.82	2.45
20-Apr-05	1520	11.18	8.77	13.05	1.74
20-Apr-05	1521	11.16	8.60	13.40	1.74
20-Apr-05	1522	11.12	8.85	13.30	2.07
20-Apr-05	1523	11.04	8.92	13.37	2.04
20-Apr-05	1524	11.44	8.25	11.88	2.16
20-Apr-05	1525	11.65	8.41	12.02	2.00

Facility: Bradley Landfill
Source: Flare #1
Job No.: W07-042
Date: 04/20/05

Run No.: 2
Fuel: LFG
Std. O2: 15

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25	20	25	100
Span:	12.05	6.99	13.00	50.80
Low:				
High:	20.01	12.01	20.00	80.20

**** POST-TEST DRIFT (DIRECT)****

Values

Zero:

Span:

0.00	0.00	0.00	0.00
11.88	6.80	13.00	50.00

Percent Drift

Zero:

Span:

0.00	0.00	0.00	0.00
-0.68	-0.95	0.00	-0.80

**** PRE-TEST BIAS ****

Values

Zero:

Span:

0.00	0.00	0.00	0.00
11.88	6.80	13.13	50.20

**** POST-TEST BIAS ****

Values

Zero:

Span:

0.00	0.00	0.00	0.00
11.88	6.80	13.00	50.00

**** BIAS CORRECTION ****

Zero Average

Span Average

0.00	0.00	0.00	0.00
11.88	6.80	13.06	50.10

**** POST-TEST DRIFT (BIAS)****

Percent Drift

Zero:

Span:

0.00	0.00	0.00	0.00
0.00	0.00	0.50	0.20

Bias-Corrected Concentration

Bias-Corrected Conc.(O2 adjusted)

12.50	7.79	9.44	3.13
		6.63	2.20

**** RAW AVERAGE CONCENTRATION ****

Average:		12.32	7.57	9.48	3.08	
O2 adjust:				6.52	2.12	
Date	Time	O2	CO2	NOx	CO	
20-Apr-05	1600	12.35	7.53	9.25	0.08	Port B
20-Apr-05	1601	12.34	7.63	9.75	0.77	
20-Apr-05	1602	12.18	7.76	9.91	1.34	
20-Apr-05	1603	12.14	7.67	9.67	1.71	
20-Apr-05	1604	11.95	7.99	10.34	1.63	
20-Apr-05	1605	12.03	7.75	9.87	2.40	
20-Apr-05	1606	12.20	7.72	9.78	3.83	
20-Apr-05	1607	12.25	7.66	9.77	3.60	
20-Apr-05	1608	12.07	7.73	9.82	2.85	
20-Apr-05	1609	12.17	7.78	9.85	3.05	
20-Apr-05	1610	12.11	7.79	9.67	3.60	
20-Apr-05	1611	12.12	7.79	9.77	2.78	
20-Apr-05	1612	12.14	7.78	9.96	2.57	
20-Apr-05	1613	12.25	7.62	9.64	3.35	
20-Apr-05	1614	12.08	7.88	10.38	3.10	
20-Apr-05	1615	12.28	7.55	9.83	2.64	
20-Apr-05	1616	12.27	7.69	9.33	2.43	
20-Apr-05	1617	12.26	7.81	9.69	2.38	
20-Apr-05	1618	12.09	7.68	9.54	2.24	
20-Apr-05	1619	12.28	7.73	9.55	2.61	
20-Apr-05	1620	12.34	7.53	9.12	2.84	
20-Apr-05	1621	12.35	7.60	9.38	3.22	
20-Apr-05	1622	12.21	7.73	9.38	2.18	
20-Apr-05	1623	12.25	7.61	9.18	1.86	
20-Apr-05	1624	12.40	7.62	8.88	2.04	
20-Apr-05	1625	12.32	7.62	9.28	1.65	
20-Apr-05	1626	12.29	7.57	9.23	2.12	
20-Apr-05	1627	12.34	7.59	9.02	2.70	
20-Apr-05	1628	12.39	7.48	8.92	3.01	
20-Apr-05	1629	12.14	7.69	9.63	2.66	
20-Apr-05	1630	12.40	7.52	9.03	1.91	
20-Apr-05	1640	12.46	7.32	9.26	16.30	Port A
20-Apr-05	1641	12.57	7.28	8.98	3.14	
20-Apr-05	1642	12.64	7.29	9.03	0.96	
20-Apr-05	1643	12.35	7.74	9.72	0.99	
20-Apr-05	1644	12.29	7.45	9.00	0.93	
20-Apr-05	1645	12.42	7.40	8.84	1.51	
20-Apr-05	1646	12.76	7.10	8.38	4.29	
20-Apr-05	1647	12.36	7.67	10.12	4.80	
20-Apr-05	1648	12.41	7.36	9.39	3.46	

20-Apr-05	1649	12.60	7.34	9.46	4.06
20-Apr-05	1650	12.46	7.53	9.78	3.95
20-Apr-05	1651	12.30	7.57	9.79	3.28
20-Apr-05	1652	12.52	7.38	9.43	3.24
20-Apr-05	1653	12.54	7.47	9.58	5.11
20-Apr-05	1654	12.51	7.36	9.56	3.61
20-Apr-05	1655	12.45	7.54	9.64	3.14
20-Apr-05	1656	12.11	7.74	10.26	2.70
20-Apr-05	1657	12.52	7.39	9.19	2.36
20-Apr-05	1658	12.55	7.32	9.32	3.69
20-Apr-05	1659	12.54	7.31	9.31	3.69
20-Apr-05	1700	12.61	7.31	9.37	4.33
20-Apr-05	1701	12.26	7.61	10.11	4.12
20-Apr-05	1702	12.67	7.24	9.03	3.02
20-Apr-05	1703	12.42	7.43	9.57	3.42
20-Apr-05	1704	11.75	8.20	11.43	2.60
20-Apr-05	1705	11.97	7.67	10.29	2.59
20-Apr-05	1706	12.40	7.61	9.36	5.01
20-Apr-05	1707	12.15	7.69	8.98	3.61
20-Apr-05	1708	12.67	7.16	8.11	4.06
20-Apr-05	1709	12.40	7.56	8.72	5.46
20-Apr-05	1710	12.44	7.44	8.63	2.68

PRETEST CALIBRATION ERROR				
LEAK CHECK				
RANGE :	25	20	100	25
	O2	CO2	CO	NOx
ZERO				
Instrument	0.00	0.20	0.00	0.00
Cylinder	0.00	0.00	0.00	0.00
Difference (%)	0.00	1.00	0.00	0.00
LOW LEVEL				
Instrument				
Cylinder				
Difference (%)	0.00	0.00	0.00	0.00
MID LEVEL				
Instrument	12.10	7.00	51.00	13.00
Cylinder	12.05	6.99	50.80	13.00
Difference (%)	0.20	0.05	0.20	0.00
HIGH LEVEL				
Instrument	20.25	11.70	80.00	20.13
Cylinder	20.01	12.01	80.20	20.00
Difference (%)	0.98	-1.55	-0.20	0.52

PRETEST		LINEARITY	
	Cylinder	Instrument	
<u>O2</u>			
Zero	0.00		0.00
High Level	20.01		20.25
Slope	0.99		
Intercept	0.00	Status	
Predicted Value	12.19	<1	
Linearity (%)	0.38	PASS	
<u>CO2</u>			
Zero	0.00		0.20
High Level	12.01		11.70
Slope	1.04		
Intercept	-0.21	Status	
Predicted Value	6.88	<1	
Linearity (%)	0.53	PASS	
<u>CO</u>			
Zero	0.00		0.00
High Level	80.20		80.00
Slope	1.00		
Intercept	0.00	Status	
Predicted Value	50.67	<1	
Linearity (%)	0.33	PASS	
<u>NOx</u>			
Zero	0.00		0.00
High Level	20.00		20.13
Slope	0.99		
Intercept	0.00	Status	
Predicted Value	13.08	<1	
Linearity (%)	0.34	PASS	

SYSTEM RESPONSE TIME			
	#1	#2	#3
Upscale			
NOx	31		
CO	78		
O2	32		
CO2	25		
Downscale			
NOx	27		
CO	70		
O2	30		
CO2	20		

NO2 CONVERTER EFFICIENCY			
Cylinder(Co)	ppm	%	status
NO Mode(C1)	18.50		
NOx Mode(C2)	0.80		
	17.75		
D1	17.70		
D2	18.95		
D3	0.75		
CE		95.76	
CE > 90 %			PASS

POST TEST CALIBRATION ERROR				
LEAK CHECK				
	O2	CO2	CO	NOx
ZERO				
Instrument	-0.25	0.00	0.00	0.00
Cylinder	0.00	0.00	0.00	0.00
Difference (%)	-1.00	0.00	0.00	0.00
LOW LEVEL				
Instrument				
Cylinder				
Difference (%)	0.00	0.00	0.00	0.00
MID LEVEL				
Instrument	12.00	7.00	50.50	13.00
Cylinder	12.05	6.99	50.80	13.00
Difference (%)	-0.20	0.05	-0.30	0.00
HIGH LEVEL				
Instrument	20.00	12.30	80.50	20.13
Cylinder	20.01	12.01	80.20	20.00
Difference (%)	-0.04	1.45	0.30	0.50

POST TEST		LINEARITY
	Cylinder	Instrument
	O2	
Zero	0.00	-0.25
High Level	20.01	20.00
Slope	0.99	
Intercept	0.25	Status
Predicted Value	11.94	<1
Linearity (%)	0.22	PASS
	CO2	
Zero	0.00	0.00
High Level	12.01	12.30
Slope	0.98	
Intercept	0.00	Status
Predicted Value	7.16	<1
Linearity (%)	0.79	PASS
	CO	
Zero	0.00	0.00
High Level	80.20	80.50
Slope	1.00	
Intercept	0.00	Status
Predicted Value	50.68	<1
Linearity (%)	0.49	PASS
	NOx	
Zero	0.00	0.00
High Level	20.00	20.13
Slope	0.99	
Intercept	0.00	Status
Predicted Value	13.08	<1
Linearity (%)	0.33	PASS

Table 5-2
Trace Organic Species
Destruction Efficiency Results
Waste Management - Bradley Landfill
Flare #1
April 20, 2005

Species	INLET			OUTLET			
	Flow rate	5969	dscfm	Flow rate	63719.8	dscfm	
	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Dest. Eff. (%)
Hydrogen Sulfide	40400	1.65E+00	1.30E+00	< 500	< 2.04E-02	< 1.72E-01	> 86.79
Benzene	2670	2.49E-01	1.97E-01	1.5	1.40E-04	1.18E-03	99.40
Benzylchloride	< 40	< 6.07E-03	< 4.79E-03	< 0.8	< 1.21E-04	< 1.02E-03	NA
Chlorobenzene	122	1.65E-02	1.30E-02	< 0.3	< 4.05E-05	< 3.41E-04	> 97.37
Dichlorobenzenes	815	1.43E-01	1.13E-01	< 1.1	< 1.93E-04	< 1.63E-03	> 98.56
1,1-dichloroethane	210	2.48E-02	1.96E-02	< 0.3	< 3.55E-05	< 2.99E-04	> 98.47
1,2-dichloroethane	67.3	7.96E-03	6.29E-03	< 0.3	< 3.55E-05	< 2.99E-04	> 95.24
1,1-dichloroethylene	63.8	7.40E-03	5.84E-03	< 0.3	< 3.48E-05	< 2.93E-04	> 94.98
Dichloromethane	692	7.03E-02	5.55E-02	< 0.3	< 3.05E-05	< 2.57E-04	> 99.54
1,2-Dibromoethane	< 30	< 6.74E-03	< 5.32E-03	< 0.3	< 6.74E-05	< 5.68E-04	NA
Perchloroethene	1690	4.79E-01	3.78E-01	< 0.2	< 5.66E-05	< 4.77E-04	> 99.87
Carbon tetrachloride	< 30	< 5.52E-03	< 4.36E-03	< 0.2	< 3.68E-05	< 3.10E-04	NA
Toluene	29900	3.29E+00	2.60E+00	0.36	< 3.96E-05	< 3.34E-04	99.99
1,1,1-trichloroethane	< 20.0	< 3.18E-03	< 2.51E-03	< 0.2	< 3.18E-05	< 2.68E-04	> 89.32
Trichloroethene	620	9.71E-02	7.66E-02	< 0.2	< 3.13E-05	< 2.64E-04	> 99.66
Chloroform	< 20	< 2.84E-03	< 2.25E-03	< 0.2	< 2.84E-05	< 2.40E-04	NA
Vinyl Chloride	185	1.38E-02	1.09E-02	< 0.2	< 1.49E-05	< 1.26E-04	> 98.85
m+p-xylenes	13000	1.65E+00	1.30E+00	0.31	3.93E-05	3.31E-04	99.97
o-xylene	4420	5.60E-01	4.42E-01	< 0.3	< 3.80E-05	< 3.20E-04	> 99.93
TNMHC	9354784	1.79E+02	1.41E+02	2351	4.50E-02	3.79E-01	99.73

Note: All values preceded by "<" are below the detection limit. The reported values are the detection limit.
NA--Not Applicable: Destruction efficiency can not be calculated since both inlet and outlet values are below the detection limit.

APPENDIX C - Laboratory Results

Facility: BRADLEY
Source: FLARE 1
Job No.: W07-042
Test Date: 04/20-21/05

SCAQMD Method 5.1

DATA SHEET FOR PARTICULATE MATTER SCAQMD METHOD 5.1

DATE SAMPLED: 04/20-21/05
DATE EXTRACTED: 04/21/05

RUN #1

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH	W07042-M5-F1-1-PF	G03224	NA	0.0857	0.0864	0.0007
FILTER ACID						0.0000
FILTER SULFATE						0.0000
B - PROBE CATCH						0.0000
PROBE ACID						0.0000
PROBE SULFATE						0.0000
C - IMP. CATCH (INSOL)	W07042-M5-F1-1-EF	G5020	860	0.0810	0.0821	0.0011
INSOLUBLE ACID						0.0000
INSOLUBLE SULFATE						0.0000
D - IMP. CATCH (SOL)	W07042-M5-F1-1-R	B5076	860	30.4803	30.4838	0.0035
SOLUBLE ACID						0.0000
SOLUBLE SULFATE						0.0000
E - ORGANIC EXTRACT	W07042-M5-F1-1-MC	B5072	125	30.7396	30.7411	0.0015
<hr/>						
TOTAL PARTICULATE	(A+B+C+D+E)					0.0068
SOLID PARTICULATE	(A+B+C+D)					0.0053

Facility: BRADLEY
Source: FLARE 1
Job No.: W07-042
Test Date: 04/20-21/05

SCAQMD Method 5.1

DATA SHEET FOR PARTICULATE MATTER SCAQMD METHOD 5.1

DATE SAMPLED: 04/20-21/05
DATE EXTRACTED: 04/21/05

RUN #2

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH	W07042-M5-F1-2-PF	G03222	NA	0.0848	0.0854	0.0006
FILTER ACID						0.0000
FILTER SULFATE						0.0000
B - PROBE CATCH						0.0000
PROBE ACID						0.0000
PROBE SULFATE						0.0000
C - IMP.CATCH(INSOL)	W07042-M5-F1-2-EF	G5041	846	0.0828	0.0836	0.0008
INSOLUBLE ACID						0.0000
INSOLUBLE SULFATE						0.0000
D - IMP. CATCH (SOL)	W07042-M5-F1-2-R	B5059	846	30.5494	30.5546	0.0052
SOLUBLE ACID						0.0000
SOLUBLE SULFATE						0.0000
E - ORGANIC EXTRACT	W07042-M5-F1-2-MC	B5075	125	29.4295	29.4307	0.0012
<hr/> TOTAL PARTICULATE (A+B+C+D+E)						0.0078
SOLID PARTICULATE (A+B+C+D)						0.0066

CHAIN OF CUSTODY RECORD

Client/Project Name <i>Waste Management Bradley Roadfill Phase 2 - San Valley, CA</i>			Project Location			ANALYSES <i>Standard Method 51</i>									
Project No. <i>007-042</i>			Field Logbook No.												
Sampler: (Signature) <i>[Signature]</i>			Chain of Custody Tape No.												
Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	REMARKS										
<i>007-042-145.1-F1-1-R</i>			<i>4/20/05</i>	<i>Memorized</i>	<i>✓</i>										<i>injection - Run 1</i>
<i>007-042-145.1-F1-1-PF</i>					<i>✓</i>										<i>filter - Run 1</i>
<i>007-042-145.1-F1-2-R</i>					<i>✓</i>										<i>injection - Run 2</i>
<i>007-042-145.1-F1-2-PF</i>					<i>✓</i>										<i>filter - Run 2</i>
Relinquished by: (Signature) <i>[Signature]</i>				Date <i>4/20/05</i>	Time <i>1520</i>	Received by: (Signature) <i>[Signature]</i>				Date <i>4/20/05</i>	Time <i>1520</i>				
Relinquished by: (Signature) <i>[Signature]</i>				Date <i>4/20/05</i>	Time <i>7/6</i>	Received by: (Signature) <i>[Signature]</i>				Date <i>4/20/05</i>	Time <i>1520</i>				
Relinquished by: (Signature) <i>[Signature]</i>				Date <i>4/20/05</i>	Time <i>7/6</i>	Received for Laboratory: (Signature) <i>[Signature]</i>				Date <i>4/20/05</i>	Time <i>1520</i>				
Sample Disposal Method:				Disposed of by: (Signature) <i>[Signature]</i>				Date <i>4/20/05</i>	Time <i>1520</i>						
SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES, INC 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781 Fax (805) 498-3173				ANALYTICAL LABORATORY <i>Phase 2.04</i>				Nº 8639							



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LABORATORY ANALYSIS REPORT

Organic Carbon Analysis in Water Impinger and Methane & TGNMO Analysis in
SUMMA Canister Samples from Impinger/Canister Train Sample Collection

Report Date: May 3, 2005
Client: Horizon Air Measurement Services, Inc.
Client Project No.: W07-042
Source Location : Waste Management / Bradley Landfill, Sun Valley CA.
Source ID: Flare no. 1 outlet

Date Received: April 21, 2005
Date Analyzed: April 21, & 25, 2005

Methane and total gaseous non-methane organics were measured by flame ionization detection/total combustion analysis (FID/TCA). Organic carbon in water vial samples were measured by Dohrman total organic carbon analyzer, water FID/TCA.

AtmAA Lab No.	Sample ID	Canister Methane	Canister Ethane	Canister TGNMO	Impinger Organic Carbon as Methane	Impinger Volume	P ₁	P ₂
				(concentration, ppmv)		(ml)		
01115-12	S4 Outlet	<1	<1	1.58	---	---	581	820
	Impinger H42	---	---	---	0.30	2.72	--	--
01115-13	S16 Outlet	<1	<1	2.20	---	---	496	820
	Impinger H45	---	---	---	0.25	2.36	--	--

*TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppm methane.
Ethane is reported as ppmv methane.*

** Note - Impinger sample results are not field blank corrected. The field blank (impinger H88) contained 0.29 ug carbon as methane, corresponding to 0.10 ppm methane for a 4.40 liter sample.
P₁ and P₂ are initial and final pressures measured in mm Hg.*

Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analysis)

Source Location : Waste Management / Bradley Landfill, Sun Valley CA.

Date Received: April 21, 2005

Date Analyzed: April 21, & 25, 2005

Components	Sample ID	Repeat	Analysis	Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
(Concentration in ppmv)					
Methane	S4 Outlet	<1	<1	---	---
	S16 Outlet	<1	<1	---	---
Ethane	S4 Outlet	<1	<1	---	---
	S16 Outlet	<1	<1	---	---
TGNMO	S4 Outlet	1.55	1.60	1.58	1.6
	S16 Outlet	2.18	2.22	2.20	0.91
Impinger TOC	Impinger H42	0.29	0.3	0.30	1.7
	Impinger H45	0.24	0.26	0.25	4.0

A set of 2 SUMMA canister/impinger samples, laboratory number 01115-(12 & 13), was analyzed for methane and total gaseous non-methane organics (TGNMO) & TOC. Agreement between repeat analysis is a measure of precision and is shown in the column "% Difference from Mean". The average % Difference from Mean for 4 repeat measurements from the sample set of 2 SUMMA canister/impinger samples is 2.0%.





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LABORATORY ANALYSIS REPORT

CO, CH₄, CO₂, and TGNMO Analysis in Tanks
and Traps by SCAQMD Method 25 (FID/TCA)

Report Date: May 3, 2005
Client: Horizon Air Measurement Services, Inc.
Client Project No.: W07-042
Source Location: Waste Management / Bradley Landfill, Sun Valley CA.
Source ID: Flare inlet

Date Received: April 25, & 27, 2005
Date Analyzed: April 25, & 28, 2005

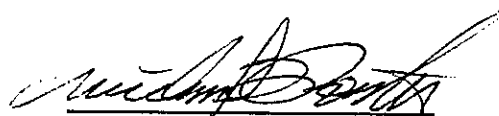
AtmAA Lab No.	Sample ID			tank CO	tank CH ₄	tank CO ₂	tank Ethane	tank TGNMO	trap CO ₂ in ICV	tank Oxygen (%v)	P ₁	P ₂
	Tank	Trap	ICV	(Concentrations in ppmv)								
01155-5	R	R	26	40.8	458000	360000	10.1	990	17200	1.84	306	820
01155-6	S	Q	25	36.5	458000	364000	10.3	870	20200	1.69	327	820

trap burn system blank 17

18.0

TGNMO is total gaseous non-methane (excluding ethane) organics reported as ppm methane.
Ethane is reported as ppmv methane.

P₁ - Initial Pressure, mm Hg
P₂ - Final Pressure, mm Hg


Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analyses)

Client Project No.: W07-042
Date Received: April 25, & 27, 2005
Date Analyzed: April 25, & 28, 2005

Components	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
(Concentration in ppmv)					
CO	TK R	40.1	41.4	40.8	1.6
CH ₄	TK R	459000	456000	458000	0.33
CO ₂	TK R	360000	359000	360000	0.14
Ethane	TK R	10.2	9.92	10.1	1.47
TGNMO	TK R	984	995	990	0.52
CO ₂ in ICV (in trap, transfer tanks)	ICV 26	17100	17300	17200	0.58
(Concentration in %v)					
Oxygen	TK R 0	1.98	1.69	1.84	8.0

A set of 2 TCA samples, laboratory numbers 01155-(5-6), was analyzed for CO, CH₄, CO₂, and total gaseous non-methane organics (TGNMO). Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean". The average % Difference from Mean for 7 repeat measurements from the sample set of 2 TCA samples is 1.8%.

Gas standards (containing CO, CH₄, CO₂ and isobutane) used for TCA analyses, were prepared and certified by Praxair.





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LABORATORY ANALYSIS REPORT

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SCAQMD Rule 1150.1 Components Analysis in Inlet Gas Tedlar Bag Sample

Report Date: May 2, 2005

Client: Horizon / WMNA

Project Location: Bradley LF #1 Flare

Client Project No.: W07-042

Date Received: April 21, 2005

Date Analyzed: April 21 & 22, 2005

AtmAA Lab No.: 01115-10

Sample I.D.: W07042

F1-M309.91-I

Components

Hydrogen sulfide

(Concentration in ppmv)

40.4

(Concentration in ppbv)

Benzene	2670
Benzylchloride	<40
Chlorobenzene	122
Dichlorobenzenes*	815
1,1-dichloroethane	210
1,2-dichloroethane	67.3
1,1-dichloroethylene	63.8
Dichloromethane	692
1,2-dibromoethane	<30
Perchloroethylene	1690
Carbon tetrachloride	<30
Toluene	29900
1,1,1-trichloroethane	<20
Trichloroethene	620
Chloroform	<20
Vinyl chloride	185
m+p-xylenes	13000
o-xylene	4420

* total amount containing meta, para, and ortho isomers

Michael L. Porter
Laboratory Director



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LABORATORY ANALYSIS REPORT

Hydrogen Sulfide and Reduced Sulfur Compounds
Analysis in Inlet Tedlar Bag Sample

Report Date: May 2, 2005
Client: Horizon / WMNA
Project Location: Bradley LF #1 Flare
Client Project No.: W07-042
Date Received: April 21, 2005
Date Analyzed: April 21, 2005

ANALYSIS DESCRIPTION

Hydrogen sulfide was analyzed by gas chromatography with a Hall electrolytic conductivity detector operated in the oxidative sulfur mode. All other components were measured by GC/ Mass Spec.

AtmAA Lab No.:	01115-10	(repeat)
Sample I.D.:	W07042	W07042
	F1-M309.91-I	F1-M309.91-I
Components	(Concentration in ppmv)	
Hydrogen sulfide	40.7	40.2
Carbonyl sulfide	0.27	
Methyl mercaptan	3.05	
Ethyl mercaptan	<0.1	
Dimethyl sulfide	5.34	
Carbon disulfide	0.12	
isopropyl mercaptan	0.24	
n-propyl mercaptan	<0.06	
Dimethyl disulfide	0.29	
TRS	50.1	

TRS - total reduced sulfur

Michael L. Porter
Laboratory Director



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LABORATORY ANALYSIS REPORT

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SCAQMD Rule 1150.1 Components Analysis in Outlet Tedlar Bag Sample

Report Date: May 2, 2005
Client: Horizon / WMNA
Project Location: Bradley LF #1 Flare
Client Project No.: W07-042
Date Received: April 21, 2005
Date Analyzed: April 21, 2005

AtmAA Lab No.: 01115-11
Sample I.D.: W07042

F1-VOCS-O

Components (Concentration in ppbv)

Hydrogen sulfide	<500
Benzene	1.50
Benzylchloride	<0.8
Chlorobenzene	<0.3
Dichlorobenzenes*	<1.1
1,1-dichloroethane	<0.3
1,2-dichloroethane	<0.3
1,1-dichloroethylene	<0.3
Dichloromethane	<0.3
1,2-dibromoethane	<0.3
Perchloroethylene	<0.2
Carbon tetrachloride	<0.2
Toluene	0.36
1,1,1-trichloroethane	<0.2
Trichloroethene	<0.2
Chloroform	<0.2
Vinyl chloride	<0.3
m+p-xylenes	0.31
o-xylene	<0.3

* total amount containing meta, para, and ortho isomers


Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analyses)

Client Project No.: W07-042
Date Received: April 21, 2005
Date Analyzed: April 21, 2005

Components	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
		(Concentration in ppbv)			
Hydrogen sulfide	F1-VOCS-O	<500	<500	---	---
Benzene	F1-VOCS-O	1.52	1.49	1.50	1.0
Benzylchloride	F1-VOCS-O	<0.8	<0.8	---	---
Chlorobenzene	F1-VOCS-O	<0.3	<0.3	---	---
Dichlorobenzenes	F1-VOCS-O	<1.1	<1.1	---	---
1,1-dichloroethane	F1-VOCS-O	<0.3	<0.3	---	---
1,2-dichloroethane	F1-VOCS-O	<0.3	<0.3	---	---
1,1-dichloroethylene	F1-VOCS-O	<0.3	<0.3	---	---
Dichloromethane	F1-VOCS-O	<0.3	<0.3	---	---
1,2-dibromoethane	F1-VOCS-O	<0.3	<0.3	---	---
Perchloroethylene	F1-VOCS-O	<0.2	<0.2	---	---
Carbon tetrachloride	F1-VOCS-O	<0.2	<0.2	---	---
Toluene	F1-VOCS-O	0.39	0.33	0.36	8.3
1,1,1-trichloroethane	F1-VOCS-O	<0.2	<0.2	---	---
Trichloroethene	F1-VOCS-O	<0.2	<0.2	---	---
Chloroform	F1-VOCS-O	<0.2	<0.2	---	---
Vinyl chloride	F1-VOCS-O	<0.3	<0.3	---	---
m+p-xylenes	F1-VOCS-O	<0.3	0.31	---	---
o-xylene	F1-VOCS-O	<0.3	<0.3	---	---

One Tedlar bag sample, laboratory number 01115-11, was analyzed for SCAQMD Rule 1150.1 components. Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean". Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 2 repeat measurements from one Tedlar bag sample is 4.6%.



CHAIN OF CUSTODY RECORD

Client/Project Name <i>Waste Management - Bradley Lane L&M Flare #1, San Valley, CA</i>			Project Location		
Project No. <i>W07-042</i>			Field Logbook No.		
Sampler: (Signature) <i>[Signature]</i>			Chain of Custody Tape No.		

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	ANALYSES	REMARKS
<i>W07042-F1-W307.91-I</i>	<i>5/20/05</i>	<i>0115-10</i>	<i>Tedder Bay</i>			
<i>W07042-F1-VOCs-O</i>			<i>-11</i>	<i>"</i>		<i>Paler</i>
<i>SUMMA 54</i>			<i>-12</i>	<i>Method 25.3</i>		<i>Outlet</i>
<i>SIS</i>			<i>-13</i>	<i>"</i>	<i>H42</i>	<i>✓ 2.5 in outlet</i>
<i>THINK L</i>			<i>-14</i>	<i>Method 25.1</i>	<i>H45</i>	<i>✓ 2.5 "</i>
<i>F</i>			<i>-15</i>	<i>"</i>	<i>DF3</i>	<i>2.5 Inlet</i>
					<i>DF-1</i>	<i>2.5 "</i>

Relinquished by: (Signature) <i>[Signature]</i>	Date <i>4/20/05</i>	Time <i>1845</i>	Received by: (Signature) <i>[Signature]</i>	Date <i>04-20-05</i>	Time <i>1845</i>
Relinquished by: (Signature) <i>[Signature]</i>	Date <i>04-21-05</i>	Time <i>1005</i>	Received by: (Signature) <i>Michael Porter</i>	Date <i>4/21/05</i>	Time <i>10:05</i>
Relinquished by: (Signature) <i>[Signature]</i>	Date	Time	Received for Laboratory: (Signature)	Date	Time

Sample Disposal Method:	Disposed of by: (Signature)	Date	Time

SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES, INC 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781 Fax (805) 498-3173	ANALYTICAL LABORATORY <i>ATMAA Inc</i>
---	---

048

Nº 8640

CHAIN OF CUSTODY RECORD

Client/Project Name

WASTE MGMT. / Bradley LF

Project Location

San Valley, CA

Project No.

W07-042

Field Logbook No.

Sampler: (Signature)

Chain of Custody Tape No.

ANALYSES

Sample No./ Identification

Date

Time

Lab Sample Number

Type of Sample

REMARKS

TANK 12
S

4/23/05
2

01155-5
-6

X X R 2.5
X X Q 2.5

Flare #1 Inlet

Relinquished by: (Signature)

Date

Time

Received by: (Signature)

Date

Time

Relinquished by: (Signature)

Date

Time

Received by: (Signature)

Date

Time

Relinquished by: (Signature)

Date

Time

Received for Laboratory: (Signature)

Date

Time

Sample Disposal Method:

Disposed of by: (Signature)

Date

Time

SAMPLE COLLECTOR

ANALYTICAL LABORATORY

HORIZON AIR MEASUREMENT SERVICES, INC
996 Lawrence Drive, Suite 108
Newbury Park, CA 91320
(805) 498-8781 Fax (805) 498-3173

Nº 8568

APPENDIX D - Field Data Sheets

D₁ upstream: 6.67.0
D₁ downstream: 8.46.9
Stack Diameter: 13.25

Leak Check

Initial: Final:

Initial:  Final: 

Side View

Flow

93" 14"

052

PLANT Burdley LF
DATE 4/26/05
LOCATION San Valley, CA
OPERATOR uc
SOURCE Flare #1 Int
NNO. 1 - SLAGS meth
SAMPLE BOXNO. C-0

METER BOX NO. 5
METER ΔH @ 1.6449
Y= 1.00110
PROBE I.D. NO. N/A
NOZZLE DIAMETER, in. N/A
STACK DIAMETER, in. 13.25"
PROBE HEATER SETTING N/A
HEATER BOX SETTING N/A
Δ Cp FACTOR N/A
FILTER NO. N/A

PRE TEST LEAK CHECKS
METER <0.001 @ 10 in. Hg
PITOTS _____ @ _____ in. Hg
ORSAT _____

[illegible]

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght
	1	2	3	4	5
Final	146	134	10		286
Initial	100	100	0		204
Liquid Collected	46	34	10		22
Total Vol. Collected					112

POST TEST LEAK CHECKS

Meter 50.001 @ 5 in. Hg
Pitots _____ @ _____ in. Hg
Orsat _____

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					

Nozzle Cal	D ₁	D ₂	D ₃	Average

PLANT Bradley CF
DATE 9/26/05
LOCATION Sun Valley, CA
OPERATOR M. W. 12
SOURCE CF Flare #1 Sun Valley
VNO. 2-SCAND meth 4.1
SAMPLE BOX NO. C-10
TIME START 1400

METER BOX NO. 5
METER ΔH @ 16449
Y= 1.0110
PROBE I.D. NO. NA
NOZZLE DIAMETER, in. NA
STACK DIAMETER, in. 4.44 in 13.20
PROBE HEATER SETTING NA
HEATER BOX SETTING NA
Δ Cp FACTOR NA
FILTER NO. NA

ASSUMED MOISTURE, % *N/A*
 AMBIENT TEMPERATURE *76°F*
 BARO. PRESS. *29.0"*
 STATIC PRESS. *N/A*
 NOMOGRAPH INDEX *N/A*

METER 0.001 @ 6 in. Hg
PITOTS @ in. Hg
ORSAT

[illegible]

TIME END = 1500

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght
	1	2	3	4	5
Final	144	101	4		242
Initial	100	100	0		200
Liquid Collected	44	4	4		22
Total Vol. Collected					44

Meter 40.000 @ 2 in. Hg
Pitots @ in. Hg
Orsat

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					

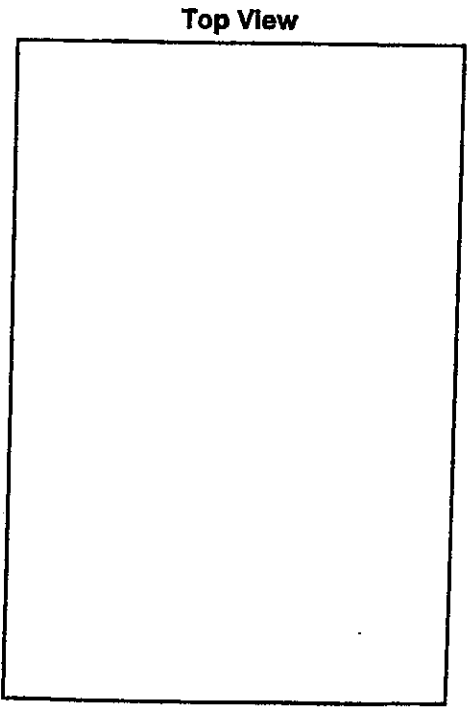
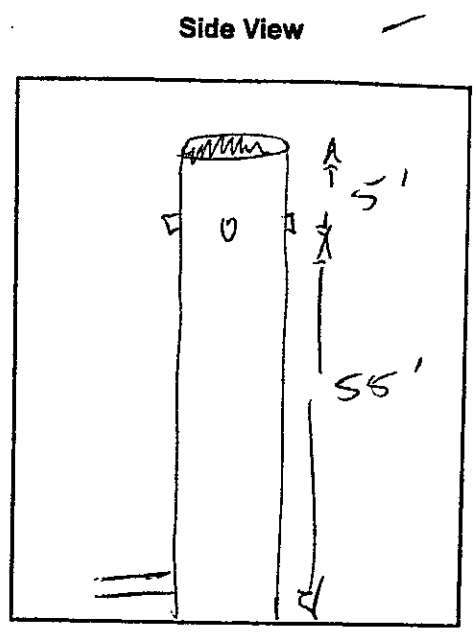
Nozzle Cal	D ₁	D ₂	D ₃	Average

Facility: Brazley LK Baro. Press: 29.02
 Source: Flare # 1 ex Static Press: _____
 Job #: W07-042 Pitot Tube #: Inco 10'
 Date: 4/20/05 Pitot Tube Type: 1/2"
 Operator: Mc, TW Magnahelic: Manometer

D₁ upstream: 0.42
 D₁ downstream: 4.6
 Stack Diameter: 144
 Leak Check
 Initial: _____ Final: _____

Run #: Preliminary

Point #	Position in.	Velocity Head in. H ₂ O	Stack Temp °F	Cyclonic Flow Angle
A-12	141.0			
11	134.4			
10	127.0			
9	118.5			
8	118.5			
7	108.0			
6	92.7			
5	51.3			
4	36.0			
3	127.0	2.55		
2	134.9	17.0		
1	141.0	3.0		
B-12				
11				
10				
9				
8				
7				
6				
5				
4				
3				
2				
1				
Average		√ΔP=	T _s =	∠=



PARTICULATE FIELD DATA

PLANT Brayley LE
 DATE 4/20/05
 LOCATION San Valley, CA
 OPERATOR RE TW
 SOURCE Flare #1 GPH
 INNO. 1-SCAPMD Meth 5.1
 SAMPLE BOX NO. 2-3

TIME START 1348

METER BOX NO. 7
 METER AH @ 1.5261
 Y= 1.0015
 PROBE I.D. NO. 101 TACON
 NOZZLE DIAMETER, in. 1.02
 STACK DIAMETER, in. 1.74
 PROBE HEATER SETTING NA
 HEATER BOX SETTING NA
 Δ Cp FACTOR 0.84
 FILTER NO. 65002

ASSUMED MOISTURE, % 10
 AMBIENT TEMPERATURE 24.5
 BARO. PRESS. 29.02
 STATIC PRESS. -0.005
 NOMOGRAPH INDEX 220 210

PRE TEST LEAK CHECKS
 METER 4.00 @ 17 in. Hg
 PITOTS 17 @ 23/23 in. Hg
 ORSAT

P#	TIME	T _s °F	ΔP in H ₂ O	√ΔP	ΔH in H ₂ O	Vm ft ³	T _{in} °F	T _{out} °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A-12	00	1680	0.01		2.2	841.013	81	81	NA	42	6
11	2.5	1682	0.01		2.2	843.3	81	81		60	6
10	5.0	1708	0.01		2.2	845.5	82	81		58	6
9	7.5	1662	0.01		2.2	844.7	84	80		56	6
8	10.0	1679	0.01		2.2	880.0	86	80		57	6
7	12.5	1698	0.01		2.2	882.2	88	80		56	6
6	15.0	1684	0.01		2.2	884.4	89	80		56	6
5	17.5	1699	0.01		2.2	886.6	84	80		57	6
4	20.0	1715	0.01		2.2	888.9	90	80		58	6
3	22.5	1668	0.01		2.2	891.1	91	80		57	6
2	25.0	1669	0.01		2.2	893.3	92	81		56	6
1	27.5	1671	0.01		2.2	895.5	93	81		57	6
B-12	30.0	1720	0.01		2.2	897.8	85	84		58	6
11	32.5	1708	0.01		2.2	900.1	87	85		57	6
10	35.0	1703	0.01		2.2	902.4	89	85		56	6
9	37.5	1695	0.01		2.2	904.7	90	85		55	6
8	40.0	1738	0.01		2.2	906.9	91	85		56	6
7	42.5	1583	0.01		2.2	909.1	93	86		55	6
6	45.0	1703	0.01		2.2	911.5	93	86		56	6
5	47.5	1710	0.01		2.2	913.7	94	86		55	6
4	50.0	1692	0.01		2.2	916.0	95	86		56	6
3	52.5	1662	0.01		2.2	918.2	95	87		55	6
2	55.0	1685	0.01		2.2	920.5	96	87		56	6
1	57.5	1714	0.01		2.2	922.7	96	87		55	6
	60.0					925.065					
Avg		1692.1		0.100	2.2	54.052		86.3			

TIME END = 1425

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	
Final	216	104	2		261
Initial	100	100	0		250
Liquid Collected	116	4	2		11
Total Vol. Collected					133

POST TEST LEAK CHECKS
 Meter 4.00 @ 17 in. Hg
 Pitots 17 @ 23/23 in. Hg
 Orsat

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					

Nozzle Cal	D ₁	D ₂	D ₃	Average

PARTICULATE FIELD DATA

PLANT East Bradley LF
 DATE 4/20/05
 LOCATION Sh. Valley, CA
 OPERATOR KEW
 SOURCE Hardy's
 VNO 2-5400 mms meth S.1
 SAMPLE BOX NO. 2-11

METER BOX NO. 7
 METER ΔH @ 1.5621
 Y= 1.0015
 PROBE I.D. NO. Inco 101
 NOZZLE DIAMETER, in. 1.02
 STACK DIAMETER, in. 144"
 PROBE HEATER SETTING NA
 HEATER BOX SETTING NA
 Δ Cp FACTOR 0.81
 FILTER NO. 303222

ASSUMED MOISTURE, % 10
 AMBIENT TEMPERATURE 27.50°C
 BARO. PRESS. 29.07
 STATIC PRESS. -0.005
 NOMAGRAPH INDEX 210

TIME START 1:00 1600

PRE TEST LEAK CHECKS
 METER 9901 @ 10 in. Hg
 PITOTS 27/27 @ 27/27 in. Hg
 ORSAT

P#	TIME	T _s °F	ΔP in H ₂ O	√ΔP	ΔH in H ₂ O	V _m ft ³	T _{in} °F	T _{out} °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
Δ-12	00	1685	0.01		2.1	925.060	90	89	NA	71	00
11	2.5	1714	0.01		2.1	921.2	91	89		62	00
10	5.0	1705	0.01		2.1	930.2	92	89		59	00
9	7.5	1721	0.01		2.1	932.5	93	89		57	00
8	10.0	1705	0.01		2.1	934.6	94	89		56	00
7	12.5	1734	0.01		2.1	936.9	96	89		55	00
6	15.0	1717	0.01		2.1	939.0	96	90		54	00
5	17.5	1742	0.01		2.1	941.2	97	90		55	00
4	20.0	1725	0.01		2.1	943.4	97	90		56	00
3	22.5	1727	0.01		2.1	945.6	97	90		57	00
2	25.0	1762	0.01		2.1	947.7	98	90		58	00
1	27.5	1739	0.01		2.1	950.0	98	91		57	00
Δ-12	30.0	1653	0.01		2.1	952.136	92	90		71	00
11	32.5	1696	0.01		2.1	954.4	93	90		60	00
10	35.0	1686	0.01		2.1	956.5	94	90		58	00
9	37.5	1672	0.01		2.1	958.7	95	90		56	00
8	40.0	1694	0.01		2.1	960.8	96	90		55	00
7	42.5	1651	0.01		2.1	963.0	96	90		58	00
6	45.0	1682	0.01		2.1	965.1	96	90		59	00
5	47.5	1665	0.01		2.1	967.3	96	90		60	00
4	50.0	1686	0.01		2.1	969.5	96	90		58	00
3	52.5	1665	0.01		2.1	971.7	95	90		57	00
2	55.0	1633	0.01		2.1	973.9	95	90		56	00
1	57.5	1682	0.01		2.1	976.1	95	89		56	00
	60.0					978.322					
Avg.		1698.0		0.1000	2.10	53.262		92.3			

TIME END = 1:10

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	
Final	142	110	2		261
Initial	100	100	0		251
Liquid Collected	42	10	2		10
Total Vol. Collected					114

POST TEST LEAK CHECKS
 Meter 9901 @ 10 in. Hg
 Pitots 27/27 @ 27/27 in. Hg
 Orsat

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					
Nozzle Cal	D ₁	D ₂	D ₃	Average	

**TOTAL COMBUSTION ANALYSIS
SCAQMD METHOD 25
FIELD SAMPLING DATA SHEET**

Job #: W07-042
Facility: Bradley
Location: San Valley, CA
Date: 4/20/05
Operator: TW

Control Device: Flare #1
Sample Location: OUTLET
Ambient Temp.: ~73°F ↑
Baro. Pressure: 29.07

SAMPLE A

Tank #: S4 Trap #: H42
Initial Vacuum: 30" / 25 torr
Final Vacuum: 13.5" 9.0"
Start Time: 1351

SAMPLE B

Tank #: S15 Trap #: H45
Initial Vacuum: 30" / 2.5 torr
Final Vacuum: 8.5"
End Time: 1525

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	
05	28	
10	26.5	
15	25	
20	23.5	
25	22	
30	20	
35	18	
40	16.5	
45	15	
50	13	
55	11	
60	9	

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	30	
05	28.5	
10	27	
15	25.5	
20	24	
25	22.5	
30	20	
35	18	
40	16	
45	14	
50	12	
55	10	
60	8.5	

LEAK RATE

Pre Test: ✓✓✓
Post Test: ✓✓✓

**TOTAL COMBUSTION ANALYSIS
SCAQMD METHOD 25
FIELD SAMPLING DATA SHEET**

Job #: W07-042
Facility: Bradley LF
Location: Sun Valley, CA
Date: 04/23/05
Operator: me

Control Device: LEG Filter #1
Sample Location: Inlet
Ambient Temp.: 75.01
Baro. Pressure: 29.10

SAMPLE A

Tank #: R Trap #: R
Initial Vacuum: 2.5
Final Vacuum: 1142
Start Time: _____

SAMPLE B

Tank #: S Trap #: Q
Initial Vacuum: 2.5
Final Vacuum: 1242
End Time: _____

TIME (min.)	VACUUM (Hg)	FLOW (cc/min)
00	29	100
05	28	100
10	27	100
15	26	100
20	25	100
25	24	100
30	23	100
35	22	100
40	21	100
45	20	100
50	19	100
55	18	100
60	17	

TIME (min.)	VACUUM (Hg)	FLOW (cc/min)
00	29	100
05	28	100
10	27	100
15	26	100
20	25	100
25	24	100
30	23	100
35	22	100
40	21	100
45	20	100
50	19	100
55	18	100
60	17	

LEAK RATE

Pre Test : 1/1
Post Test: 1/1

CEM TEMPERATURE DATA

Facility: Braellay LF

Date: 4/20/05

Job No.: W07-042

Run #: 1, 2

Source: Flare #1

Probe Temp Settings: 7250.9

Heated Line Temp Settings: 7250.9

TEMPERATURES °F				
	Time	Condenser Outlet	Probe	Teflon Line
1	00	36	7250.9	7250.9
2	10	36		
3	20	35		
4	30	36		
5	40	36		
6	50	36		
7	60	36		
8	00	36		
9	10	36		
10	20	36		
11	30	36		
12	40	36		
13	50	36		
14	60			
15				

APPENDIX E - Calibration Information

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR

P.O NUMBER

REFERENCE STANDARD

 COMPONENT
 NITRIC OXIDE

 NIST SRM NO.
 vs. SRM#2629

 CYLINDER NO.
 CC 144870

 CONCENTRATION
 24.81 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

1. COMPONENT NITRIC OXIDE		ANALYZER MAKE-MODEL-S/N		Thermo Env. 42H S/N 42H-44979-273	
ANALYTICAL PRINCIPLE		CHEMILUMINESCENCE		LAST CALIBRATION DATE	
FIRST ANALYSIS DATE		11/02/04		SECOND ANALYSIS DATE	
Z 0.0	R 24.1	C 18.8	CONC. 19.4	Z 0.1	R 24.0
R 24.1	Z 0.0	C 18.8	CONC. 19.4	R 24.0	Z 0.1
Z 0.0	C 18.8	R 24.1	CONC. 19.4	Z 0.1	C 18.9
U/M ppm		MEAN TEST ASSAY	19.4	U/M ppm	
					MEAN TEST ASSAY 19.5

VALUE NOT VALID BELOW 150 PSIG. NOx VALUE FOR REFERENCE ONLY.
 LAST ANALYSIS: NO=20.2 ppm 9/20/02

THIS CYLINDER NO. CC 150203 HAS BEEN CERTIFIED ACCORDING TO SECTION OF TRACEABILITY PROTOCOL NO. REV. 9/97 PROCEDURE G1 CERTIFIED ACCURACY ± 1 % NIST TRACEABLE CYLINDER PRESSURE 1000 PSIG CERTIFICATION DATE 11/09/04 EXPIRATION DATE 11/09/06 TERM 24 MONTHS	CERTIFIED CONCENTRATION NITRIC OXIDE 19.4 ppm NITROGEN BALANCE NOx 20.0 ppm
--	---

ANALYZED BY

Joseph Charles
 JOSEPH CHARLES (M)

CERTIFIED BY

Phil Kim
 PHIL KIM

IMPORTANT

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.



Praxair Distribution, Inc.
5700 S. Alameda Street
Los Angeles, CA 90058
Tel: 323-585-2154
Fax: 714-542-6689

6/9/04

Horizon Air
996 LAWRENCE DR STE 108
NEWBURY PARK, CA 91320
USA

Attention: HORIZON AIR MEASUREMENTS

Praxair Order No. **953055-00**
Customer Reference No.

Product Lot/Batch No. **109326903**
Praxair Part No. **EV NINX19MP-AS**

CERTIFICATE OF ANALYSIS

Primary Standard

<u>Component</u>	<u>Requested Concentration</u>	<u>Certified Concentration</u>	<u>Analytical Principle</u>	<u>Analytical Accuracy</u>
Nitrogen dioxide (AS NOX)	19 ppm	18.5 ppm	A	±1 %
Nitrogen		balance		

Analytical Instruments: **Thermo Environmental~42H~Chemiluminescence~Other**

Cylinder Style: **AS**
Cylinder Pressure @70F: **1700 psig**
Cylinder Volume: **122 ft³**
Valve Outlet Connection: **660**

Filling Method: **Gravimetric**
Date of Fill: **9/25/03**
Expiration Date: **6/8/06**

Cylinder No(s): **CC 149665**

Comments: **NO=0.5 ppm VALUE IS FOR REFERENCE ONLY.**

Analyst: 
Joseph Charles

QA Reviewer: 
Phu Tien Nguyen

The gas calibration cylinder standard prepared by Praxair Distribution is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Reference Materials which are either prepared by weights traceable to the National Institute of Standards and Technology (NIST) or by using NIST Standard Reference Materials where available.

Note: All expressions for concentration (e.g., % or ppm) are for gas phase, by volume (e.g., ppmv) unless otherwise noted.

Key to Analytical Techniques:

A Chemiluminescence	B Gravimetric	C Electrolytic Cell	D Photoionization HNU
E Pulsed Fluorescence	F Ultra Violet Spectrometry		

IMPORTANT

The information contained herein has been prepared at your request by personnel within Praxair Distribution. While we believe the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall liability of Praxair Distribution, Inc. arising out of the use of the information contained herein exceed the fee established for providing such information.

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENTS

P.O NUMBER 8565

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE GMIS	VS. SRM#1678	CC 160092	51.1 ppm
NITRIC OXIDE GMIS	1683b	SA 7757	49.7 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

1. COMPONENT CARBON MONOXIDE GMIS		ANALYZER MAKE-MODEL-S/N		Siemens Ultramat SE S/N A12-729	
ANALYTICAL PRINCIPLE NDIR				LAST CALIBRATION DATE 03/19/05	
FIRST ANALYSIS DATE 02/20/05				SECOND ANALYSIS DATE 03/28/05	
Z 0.0	R 51.1	C 50.6	CONC. 50.6	Z 0.0	R 51.1
R 51.1	Z 0.0	C 50.7	CONC. 50.7	R 51.2	Z 0.0
Z 0.0	C 50.6	R 51.1	CONC. 50.6	Z 0.0	C 51.0
U/M ppm	MEAN TEST ASSAY 50.6 ppm	U/M ppm	MEAN TEST ASSAY 50.9 ppm		
2. COMPONENT NITRIC OXIDE GMIS		ANALYZER MAKE-MODEL-S/N		BECKMAN 951A S/N#0101354	
ANALYTICAL PRINCIPLE CHEMILUMINESCENCE				LAST CALIBRATION DATE 03/01/05	
FIRST ANALYSIS DATE 02/20/05				SECOND ANALYSIS DATE 03/28/05	
Z 0.0	R 479.6	C 486.3	CONC. 50.4	Z 0.0	R 471.0
R 479.1	Z 0.0	C 486.3	CONC. 50.4	R 470.4	Z 0.0
Z 0.0	C 486.6	R 478.6	CONC. 50.5	Z 0.0	C 478.6
U/M mV	MEAN TEST ASSAY 50.4 ppm	U/M mV	MEAN TEST ASSAY 50.5 ppm		

NOx value solely for reference use. Values not valid below 150 psig.

THIS CYLINDER NO.	CC 110519	CERTIFIED CONCENTRATION	
HAS BEEN CERTIFIED ACCORDING TO SECTION	EPA-600/R97/121	CARBON MONOXIDE	50.8 ppm
OF TRACEABILITY PROTOCOL NO.	Rev. 9/97	NITRIC OXIDE	50.4 ppm
PROCEDURE	G1	NITROGEN	BALANCE
CERTIFIED ACCURACY	± 1 % NIST TRACEABLE	NOx	51.1 ppm
CYLINDER PRESSURE	2000 PSIG		
CERTIFICATION DATE	03/28/05		
EXPIRATION DATE	03/28/07	TERM	24 MONTHS

ANALYZED BY

CHRIS VU

CERTIFIED BY

MICHAEL TSANG

IMPORTANT

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENTS

P.O NUMBER 8488

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
NITRIC OXIDE GMIS	vsSRM#1684b	CC 136077	99.1 ppm
CARBON MONOXIDE GMIS	vs.SRM#1679	CC 160064	101.3 ppm

ANALYZER READINGS

R=REFERENCE STANDARD
Z=ZERO GAS
C=GAS CANDIDATE

1. COMPONENT NITRIC OXIDE GMIS ANALYTICAL PRINCIPLE CHEMILUMINESCENCE FIRST ANALYSIS DATE 11/24/04 Z 0.0 R 948.0 C 766.8 CONC. 80.2 R 947.2 Z 0.0 C 765.9 CONC. 80.1 Z 0.0 C 767.2 R 948.0 CONC. 80.2 U/M mV MEAN TEST ASSAY 80.2	ANALYZER MAKE-MODEL-S/N BECKMAN 951A S/N#0101354 LAST CALIBRATION DATE 11/01/04 SECOND ANALYSIS DATE Z R C CONC. R Z C CONC. Z C R CONC. U/M mV MEAN TEST ASSAY	
2. COMPONENT CARBON MONOXIDE GMIS ANALYTICAL PRINCIPLE NDIR FIRST ANALYSIS DATE 11/24/04 Z 0.0 R 101.3 C 80.1 CONC. 80.1 R 101.3 Z 0.0 C 80.0 CONC. 80.0 Z 0.0 C 80.1 R 101.3 CONC. 80.1 U/M ppm MEAN TEST ASSAY 80.1	ANALYZER MAKE MODEL-S/N HORIBA, VIA-510, S/N 576876015 LAST CALIBRATION DATE 11/02/04 SECOND ANALYSIS DATE Z R C CONC. R Z C CONC. Z C R CONC. U/M ppm MEAN TEST ASSAY	

VALUES NOT VALID BELOW 150 PSIG

 LAST ASSAY DATE AND RESULTS: 11/22/02, 81.0 ppm NO, 80.4 ppm CO,
 81.1 ppm NOx.

THIS CYLINDER NO. CC 138486 HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121 OF TRACEABILITY PROTOCOL NO. REV 9/97 PROCEDURE G1 CERTIFIED ACCURACY ± 1 % NIST TRACEABLE CYLINDER PRESSURE 1500 PSIG CERTIFICATION DATE 11/24/04 EXPIRATION DATE 11/24/06 TERM 24 MONTHS	CERTIFIED CONCENTRATION NITRIC OXIDE 80.6 ppm CARBON MONOXIDE 80.2 ppm NITROGEN BALANCE NOx 81.0 ppm
--	---

ANALYZED BY

MICHAEL TSANG

CERTIFIED BY

CHRIS VU

IMPORTANT

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3/10/05

Horizon Air
996 Lawrence Dr Ste 108
Newbury Park, CA
USA 91320

Attention: Deborah Vacherst

Praxair Order No. **43172600**
Customer Reference No.

Product Lot/Batch No. **109434618**
Praxair Part No. **EV NICDOXP1-AS**

CERTIFICATE OF ANALYSIS *Primary Standard*

<u>Component</u>	<u>Requested Concentration</u>	<u>Certified Concentration</u>	<u>Analytical Principle</u>	<u>Analytical Accuracy</u>
Carbon dioxide	7 %	6.99 %	V	±0.02 % abs.
Oxygen	12 %	12.05 %		±0.02 % abs.
Nitrogen	balance	balance		

Analytical Instruments: **Mettler-ID5~Gravimetric**
Cylinder Style: **AS**
Cylinder Pressure @70F: **2000 psig**
Cylinder Volume: **148 ft3**
Valve Outlet Connection: **590**
Cylinder No(s): **CC 144975**

Filling Method: **Gravimetric**
Date of Fill: **12/11/04**
Expiration Date: **3/9/08**

Analyst: **Jack Fu**

QA Reviewer: **Ty Triplett**

The gas calibration cylinder standard prepared by Praxair Distribution is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Reference Materials which are either prepared by weights traceable to the National Institute of Standards and Technology (NIST) or by using NIST Standard Reference Materials where available.

Note: All expressions for concentration (e.g., % or ppm) are for gas phase, by volume (e.g., ppmv) unless otherwise noted.

Key to Analytical Techniques:

A Flame Ionization with Methanizer	B Gas Chromatography with Discharge Ionization Detector	C Gas Chromatography with Electrolytic Conductivity Detector	D Gas Chromatography with Flame Ionization Detector
E Gas Chromatography with Flame Photometric Detector	F Gas Chromatography with Helium Ionization Detector	G Gas Chromatography with Methanizer Carbonizer	H Gas Chromatography with Photoionization Detector
I Gas Chromatography with Reduction Gas Analyzer	J Gas Chromatography with Thermal Conductivity Detector	K Gas Chromatography with Ultrasonic Detector	L Infrared - FTIR or NDIR
M Mass Spectrometry - MS or GC/MS	N Proprietary	O Paramagnetic	P Specific Water Analyzer
Q Total Hydrocarbon Analyzer	R Wet Chemical	S Detector Tube	T Odor
U Chemiluminescence	V Gravimetric	W Electrolytic Cell/Electrochemical	X Photoionization
Y Pulsed Fluorescence	Z UV Spectrometry		

IMPORTANT

The information contained herein has been prepared at your request by personnel within Praxair Distribution. While we believe the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall liability of Praxair Distribution, Inc. arising out of the use of the information contained herein exceed the fee established for providing such information.

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (525) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS

CUSTOMER HORIZON AIR MEASUREMENTS

DATE 05/12/04

P.O NUMBER

REF. NUMBER 67757400

REQUESTED COMPOSITION

GAS	CONCENTRATION
CARBON DIOXIDE	12 %
OXYGEN	20 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY	±0.02%abs

ANALYTICAL METHOD

INSTRUMENT

Mettler ID5, S/N:1865166

Mettler ID5, S/N:1865166

ANALYTICAL PRINCIPLE

Gravimetric

Gravimetric

Values not valid below 150 psig.

THIS CYLINDER NO. SA 20202
CYLINDER PRESSURE 2000 PSIG
EXPIRATION DATE 12/31/07
CLASSIFICATION PRIMARY STANDARD
BATCH NUMBER N/A
LOT NUMBER 109413306
PART NUMBER NI CDOXP80-AS
CYLINDER SIZE AS CGA 590 152 CFT

CERTIFIED CONCENTRATION

CARBON DIOXIDE	12.01 %
OXYGEN	20.01 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY	±0.02%abs

ANALYZED BY

JACK BU

CERTIFIED BY

TY TRIPLETT

IMPORTANT

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

668

Magnehelic Gauge Calibration Data

Range: 0 - 5.0"

Date: 01/05/2004

Calibrated by: F.Torres

BAROMETRIC PRESURE: 29.12

Reference: 0.0-10.0 Manometer

SYSTEM

LEAK CHECKS (Y/N): Y

POINT

LEAK CHECK (Y/N): Y

Magnehelic Box 3

Serial # R980817MLG44

MAG	MAN R1	MAN R2	MAN R3	MEAN	MEAN/MAG
1.00	1.00	1.00	1.00	1.000	1.000
2.00	2.00	2.00	2.00	2.000	1.000
3.00	3.00	3.00	3.00	3.000	1.000
4.00	4.00	4.00	4.00	4.000	1.000
5.00	5.00	5.00	5.00	5.000	1.000
Correction Factor:					1.0000

Control Box Calibration Data

Date: 01/04/05

Calibrated by: Bill Jones

Meter Box Number: 5

Barometric Pressure: 28.86

Wet Test Meter Cf: 0.9971

Orifice setting (H)	Gas Volumes			Temperatures			Time (min)	Y	H@
	Wet Test (cu.ft)	Dry Gas Initial (cu.ft)	Dry Gas Final (cu.ft)	DGM Initial (°F)	DGM final (°F)	WTM (°F)			
0.5	11.222	522.269	533.248	70	76	72	26	1.0198	1.5746
1.0	11.378	510.809	522.085	71	77	70	19	1.0107	1.6213
1.5	13.744	496.934	510.587	70	77	69	19	1.0084	1.6612
2.0	11.609	485.229	496.707	69	76	69	14	1.0095	1.6896
3.0	11.294	473.941	485.076	67	74	68	11	1.0084	1.6523
4.0	11.828	462.225	473.775	64	71	68	10	1.0094	1.6702
AVERAGE								1.0110	1.6449

Reviewed by: 

Control Box Calibration Data

Date: 01/03/05

Calibrated by: Bill Jones

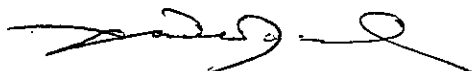
Meter Box Number: 7

Barometric Pressure: 28.94

Wet Test Meter Cf: 0.9971

Orifice setting (H)	Gas Volumes			Temperatures			Time (min)	Y	H@
	Wet Test (cu.ft)	Dry Gas Initial (cu.ft)	Dry Gas Final (cu.ft)	DGM Initial (°F)	DGM final (°F)	WTM (°F)			
0.5	11.017	599.764	610.945	74	76	60	25	1.0091	1.4344
1.0	10.975	588.339	599.496	74	77	60	18	1.0070	1.4972
1.5	11.778	576.038	588.000	71	77	60	16	1.0044	1.5443
2.0	11.830	563.839	575.848	69	75	60	14	0.9998	1.5685
3.0	11.475	551.870	563.440	66	73	60	11	0.9989	1.5518
4.0	12.078	539.424	551.553	58	69	60	10	0.9895	1.5604
AVERAGE								1.0015	1.5261

Reviewed by:



probe 10-1

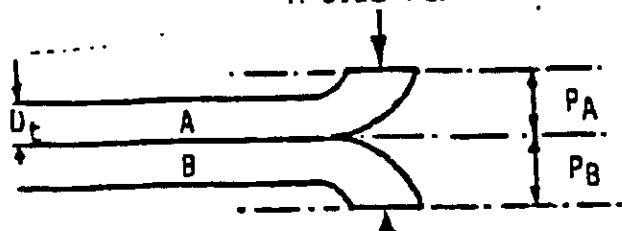
TYPE S PITOT TUBE INSPECTION DATA FORM

Tubing diameter, D_t 0.362 in.

Pitot Tube Assembly Level? Yes / No

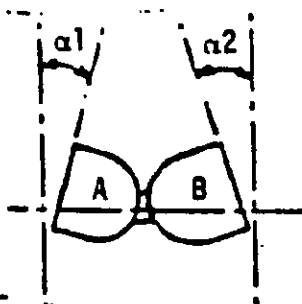
Pitot Tube Openings Damaged? Yes / No

A-SIDE PLANE

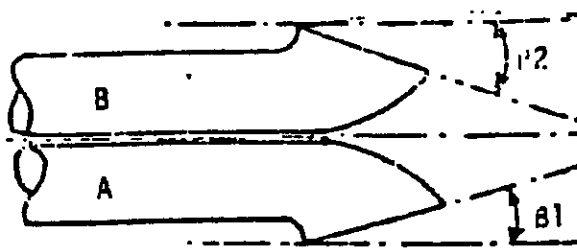


NOTE: 0.986

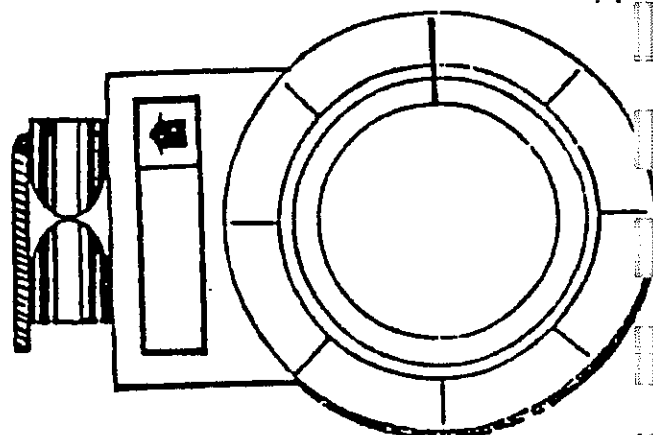
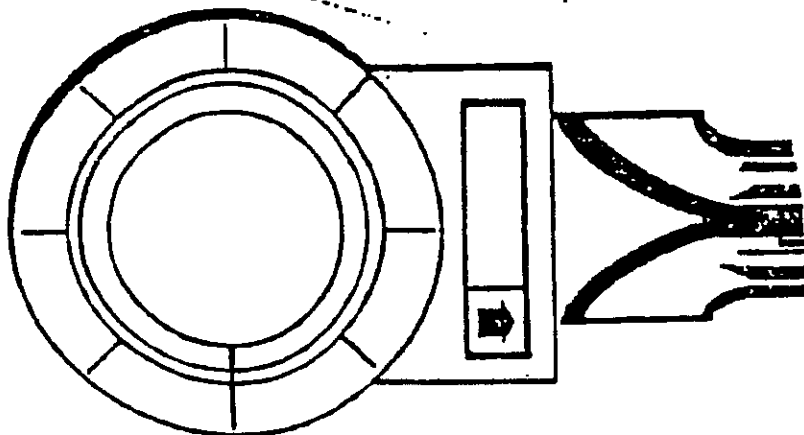
$\left\{ \begin{array}{l} 1.05 D_t < P < 1.50 D_t \\ P_A = P_B \end{array} \right.$ $P_A = \underline{0.493}$ in. $P_B = \underline{0.493}$ in.



$\alpha_1 = \underline{2}^\circ$
 $\alpha_2 = \underline{2}^\circ$
($< 10^\circ$)



$\beta_1 = \underline{1.0}$
 $\beta_2 = \underline{1.0}$
($< 5^\circ$)



Level Position to Find $\gamma = \underline{1.5}$

$Z = A \sin \gamma = \underline{0.026}$ in. ($< 1/8$ in.)

Level Position to find $\theta = \underline{1.5}$

$W = A \sin \theta = \underline{0.026}$ in. ($< 1/32$ in.)

Comments _____

Checked by: [Signature]

Date: 1-6-05

Calibration Required? NO

STACK TEMPERATURE SENSOR CALIBRATION DATA- APEX PROBE ASSEMBLIES

Date: 01/10/06

Calibrated by: B. Jones

THERMOCOUPLE

ID:

	ICE WATER									BOILING WATER									BOILING OIL								
	REF			TC			ABSOLUTE T DIFF., %			REF			TC			ABSOLUTE T DIFF., %			REF			TC			ABSOLUTE T DIFF., %		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Stainless Steel Probes																											
3-1	32	32	32	30	30	30	0.4	0.4	0.4	212	212	212	211	211	210	0.1	0.1	0.3	538	538	536	534	534	535	0.2	0.2	0.1
4-2	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	210	209	210	0.3	0.4	0.3	535	534	534	535	533	532	0.0	0.1	0.2
4-3	32	32	32	30	31	31	0.4	0.2	0.2	212	212	212	211	210	210	0.1	0.3	0.3	547	548	548	544	545	546	0.3	0.3	0.2
6-2	31	32	32	31	31	30	0.0	0.2	0.4	210	211	211	208	209	210	0.3	0.3	0.0	535	535	535	536	534	534	-0.1	0.1	0.1
6-3	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	210	210	210	0.3	0.3	0.3	535	536	536	536	535	535	-0.1	0.1	0.1
6-4	32	31	32	31	30	30	0.2	0.2	0.4	212	212	212	211	211	211	0.2	0.1	0.1	535	534	538	536	533	535	-0.1	0.1	0.3
A6-5	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	211	211	210	0.1	0.1	0.3	540	539	539	537	537	537	0.3	0.2	0.2
A8-1	32	32	31	31	30	31	0.2	0.4	0.0	212	212	212	211	211	211	0.1	0.1	0.1	538	537	537	536	535	535	0.0	0.2	0.2
A8-2	32	32	32	30	31	31	0.4	0.2	0.2	212	212	212	210	210	210	0.3	0.3	0.3	537	537	535	536	536	533	0.1	0.1	0.2
A8-3	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	211	211	211	0.1	0.1	0.1	550	550	550	549	549	550	0.1	0.1	0.0
10-1	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	211	211	211	0.1	0.1	0.1	536	537	536	533	533	533	0.3	0.4	0.3
M17-2	32	32	32	31	31	30	0.2	0.2	0.4	212	212	212	211	211	211	0.1	0.1	0.1	536	536	535	536	535	533	0.0	0.1	0.2
M17-3	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	210	211	211	0.3	0.1	0.1	534	538	535	533	535	536	0.1	0.1	-0.1
Inconel																											
10-1 Inc	32	32	32	30	31	32	0.4	0.2	0.0	212	212	212	210	211	211	0.3	0.1	0.1	548	548	548	545	548	544	0.3	0.0	0.4
6-1 Inc	32	32	32	30	30	31	0.4	0.4	0.2	212	212	212	211	211	211	0.1	0.1	0.1	550	550	550	548	548	548	0.2	0.2	0.2
Loose Thermocouple																											
6-5	32	32	32	33	30	31	-0.2	0.4	0.2	212	212	212	209	211	210	0.4	0.1	0.3	532	533	533	530	531	530	0.2	0.2	0.3
6-8	32	32	32	30	31	31	0.4	0.2	0.2	212	212	212	210	211	212	0.3	0.1	0.0	548	549	549	545	545	545	0.3	0.4	0.4
7-1	32	32	32	30	30	30	0.4	0.4	0.4	212	212	212	210	210	210	0.3	0.3	0.3	533	534	536	531	533	536	0.2	0.1	0.0
8-3	32	32	32	31	31	31	0.2	0.2	0.2	212	212	212	211	211	211	0.1	0.1	0.1	550	550	550	549	549	550	0.1	0.1	0.0

Note: If absolute temperature values of the reference thermometer being calibrated and the stack temperature sensors agree within 1.5 percent at each of the three calibration points, no correction is needed.

APPENDIX F - Strip Chart Data

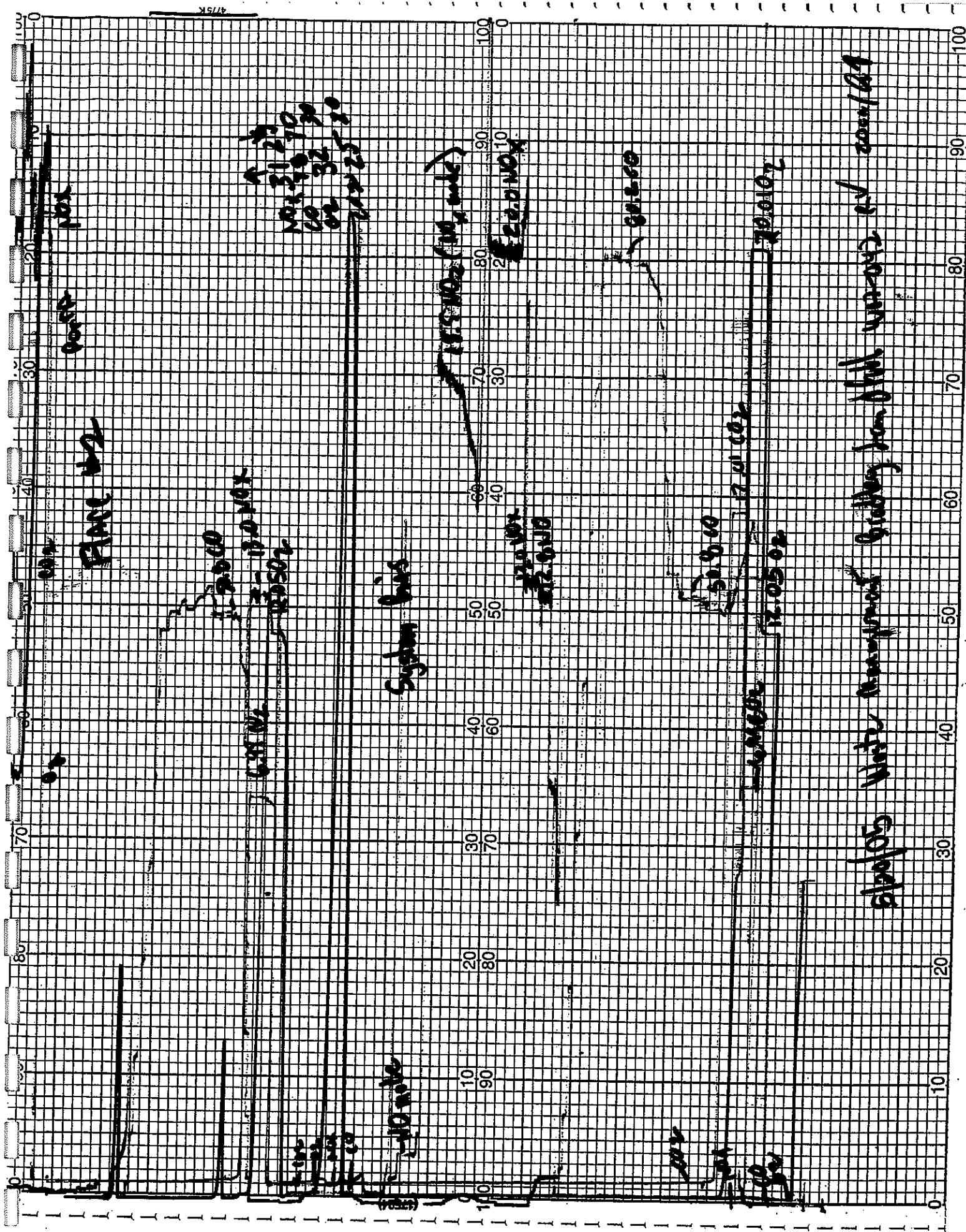
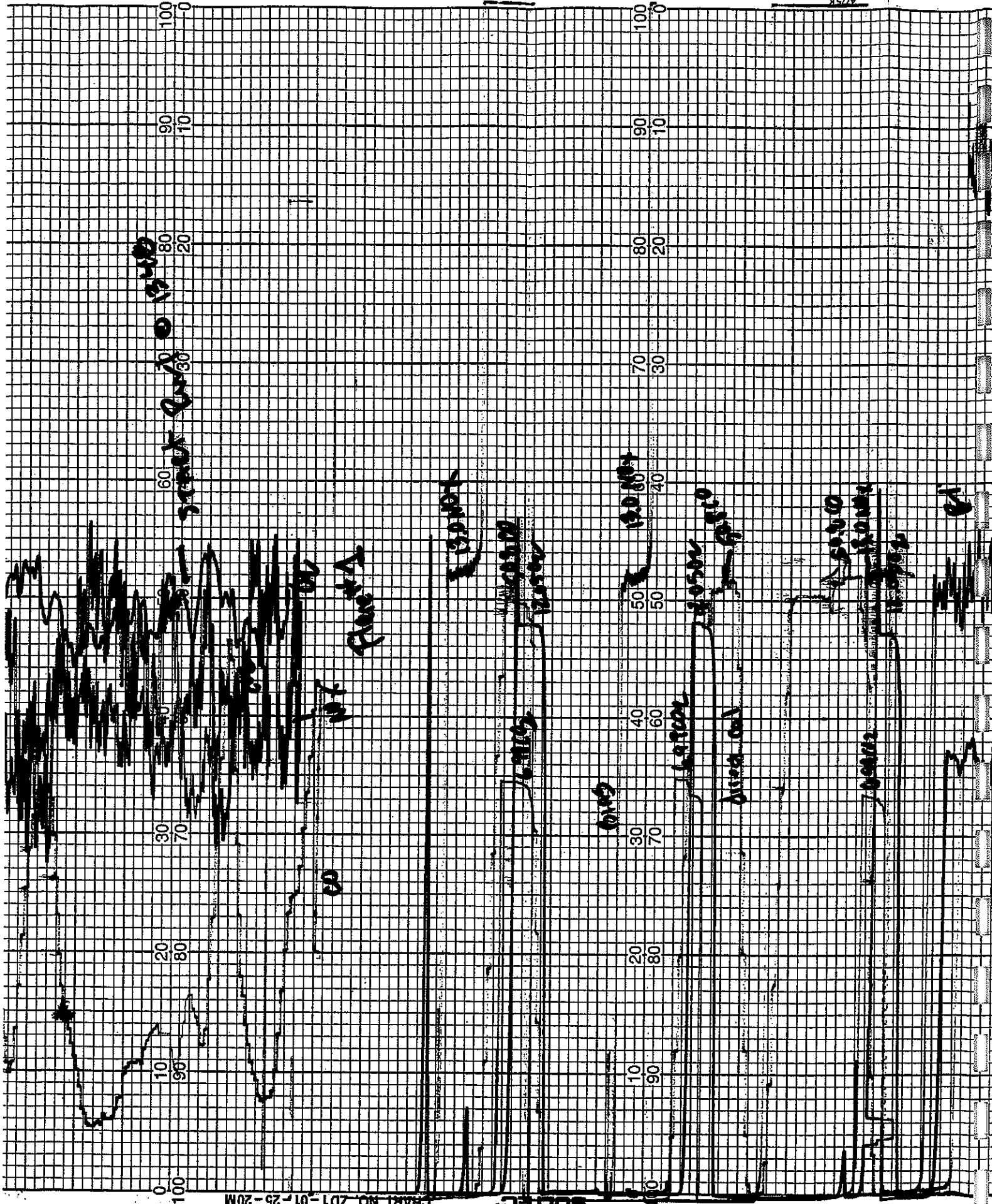
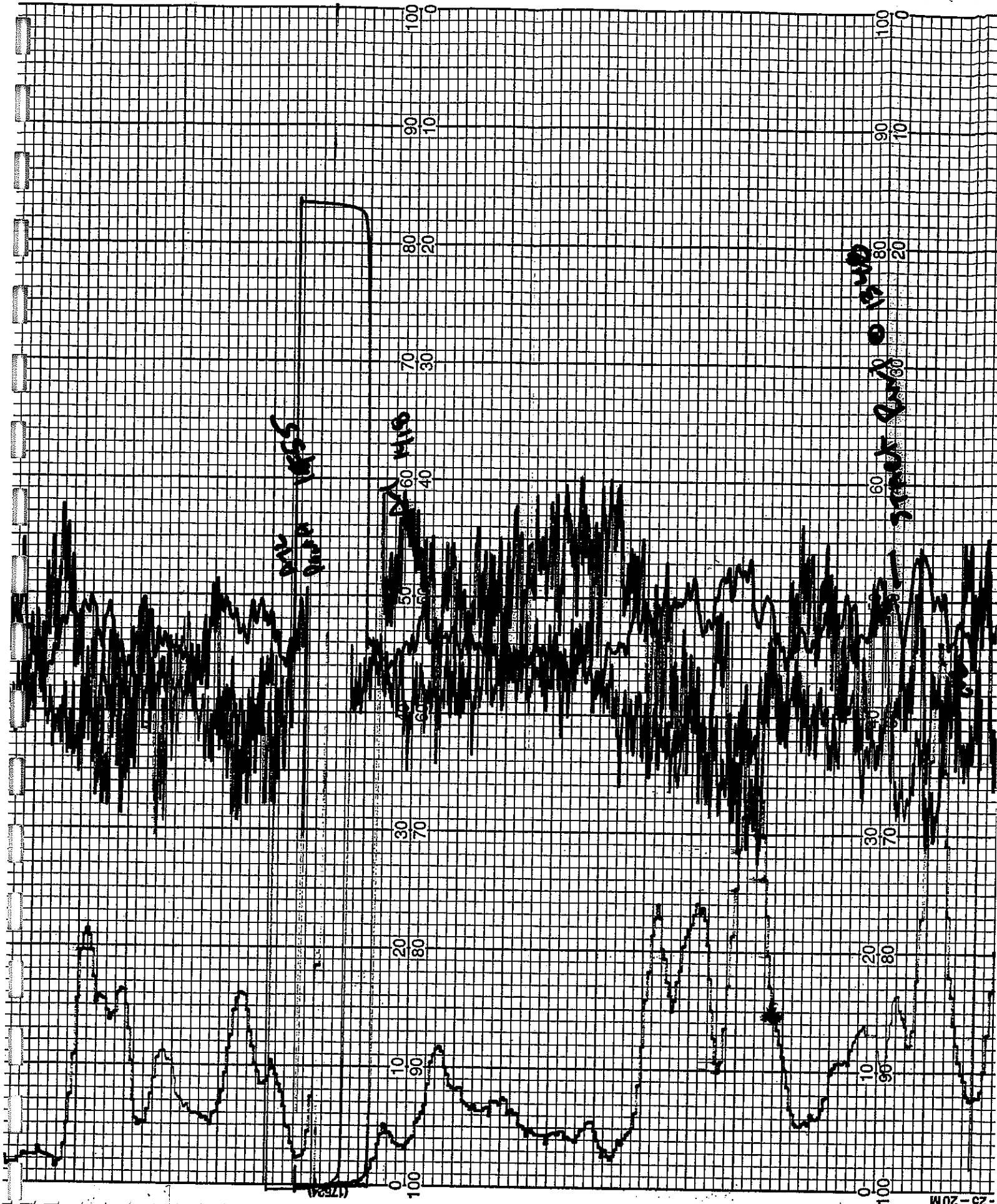
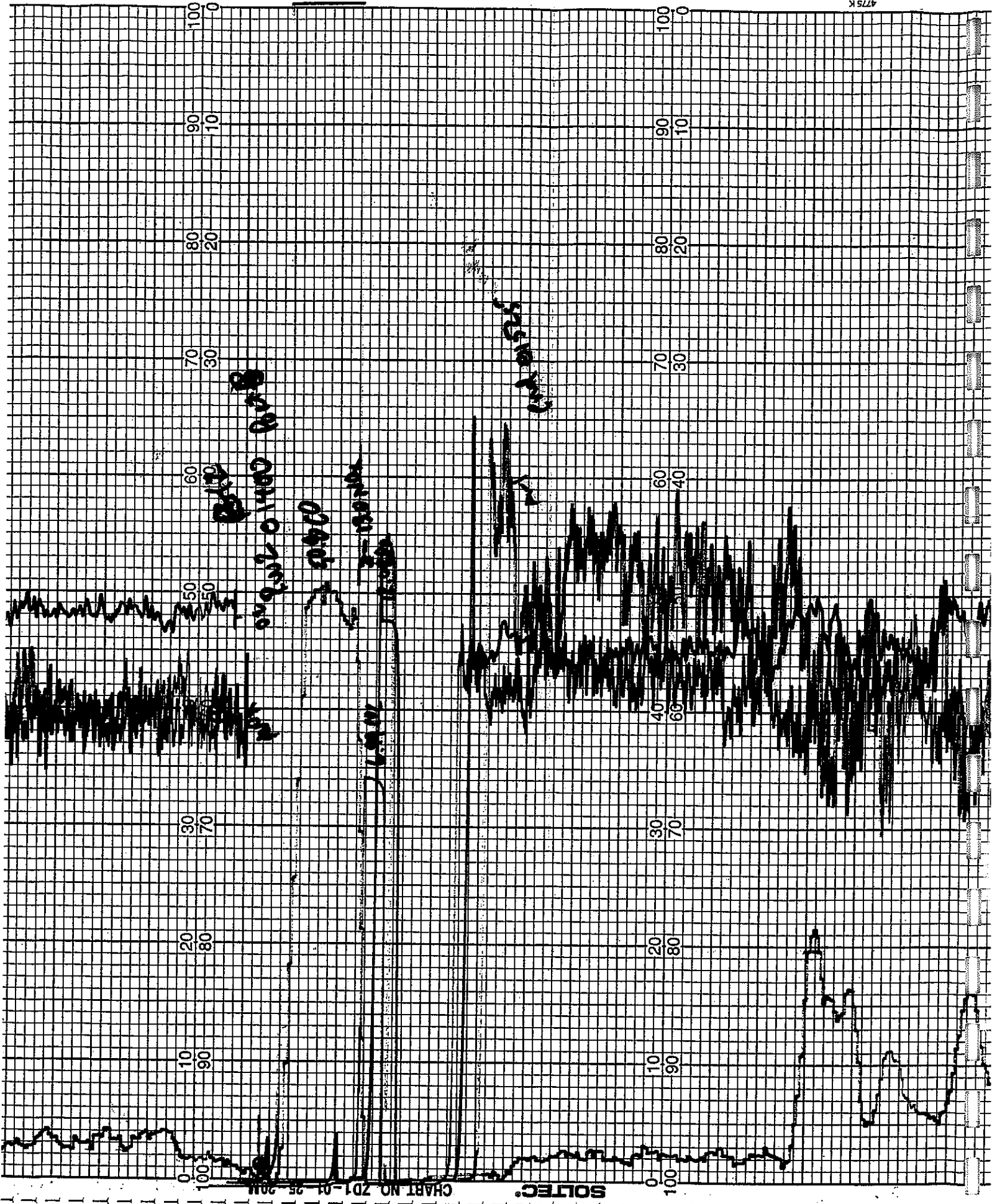
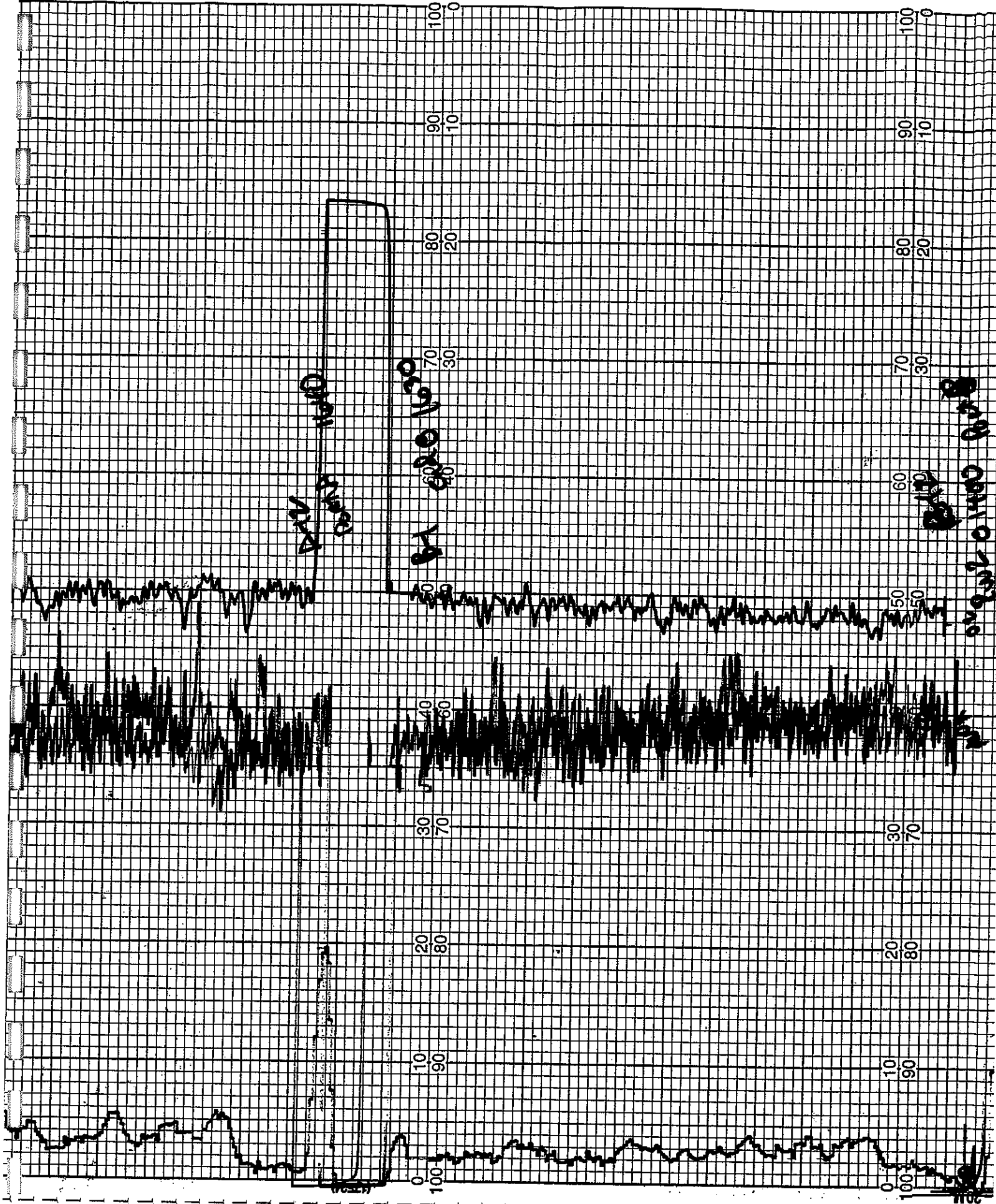


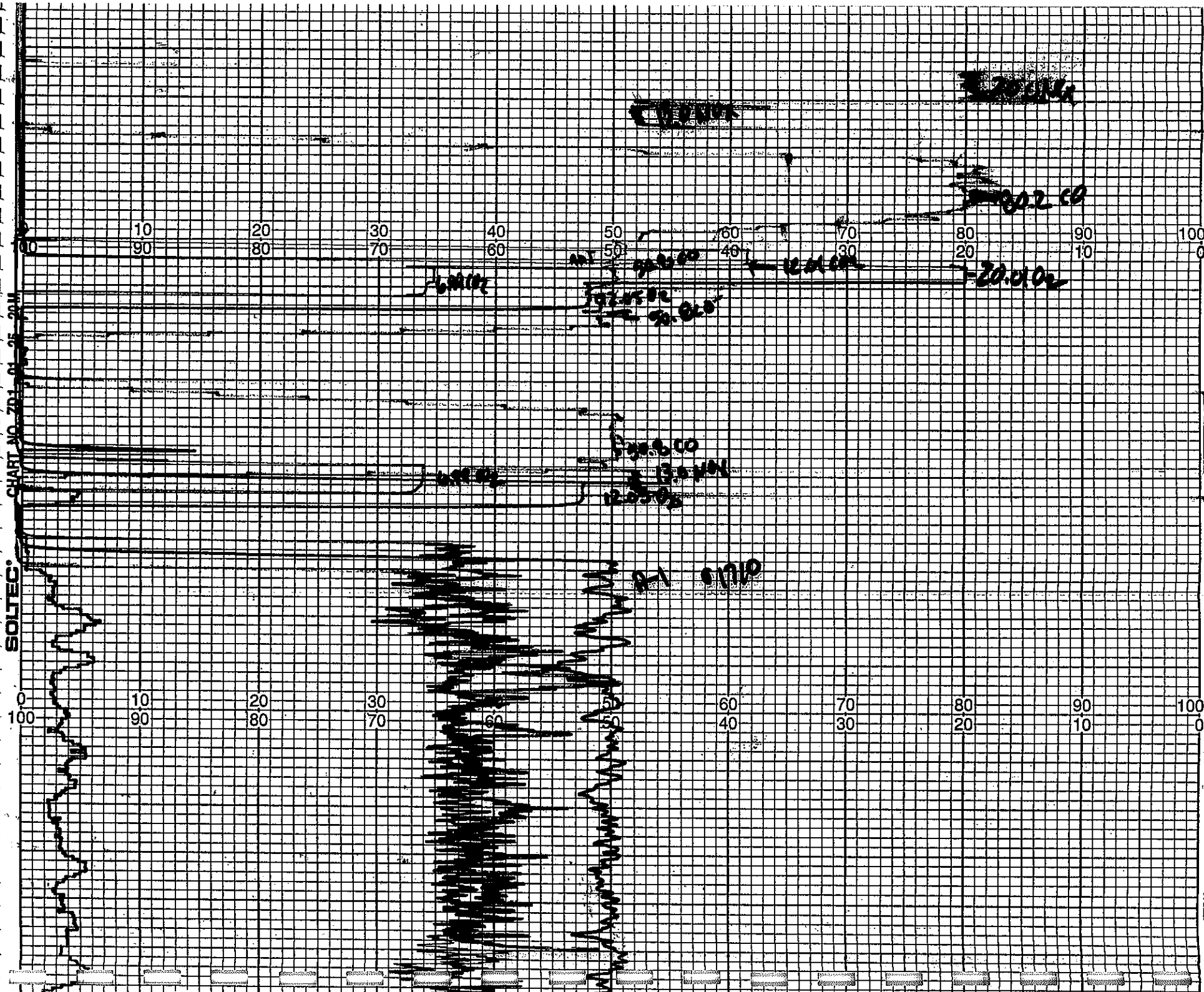
CHART NO. ZD1-01-25-20M











APPENDIX G - Process Data

Flare #1			
Rw1	sfm	gpm	°F
1350	5540	3.4	1690
1400	5560	3.4	1670
1410	5540	3.4	1668
1420	5535	3.4	1670
1455	5473	3.4	1689
1505	5540	3.4	1674
1515	8536	3.4	1675
1525	8540	3.4	1672
Rw2	5536	3.4	1676
1600	5500	3.4	1679
1610	5485	3.4	1671
1620	5530	3.4	1671
1630	5485	3.4	1676
1640	5476	0.0	1676
1650	5307	3.4	1674
1700	5289	3.4	1682
1710	5820	3.4	1681
	5461	3.0	1670

APPENDIX H - Permit to Operate



SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 East Copley Drive, Diamond Bar, CA 91765

Page 1
Application No.
425253

PERMIT TO CONSTRUCT

Legal Owner
or Operator:

WASTE MGMT DISPOSAL & RECYCLING SERVS INC
9081 TUJUNGA AVE
SUN VALLEY, CA 91352

Granted as of 3/18/2004
ID 50310

Equipment Location: 9227 TUJUNGA AVE, SUN VALLEY, CA 91352-1542

Equipment Description :

LANDFILL GAS FLARING SYSTEM NO. 1 CONSISTING OF:

1. LIQUID KNOCKOUT/PARTICULATE REMOVAL VESSEL, JOHN ZINK, 2'-6" DIA. X 6'-0" H.
2. TWO BLOWERS, ONE STANDBY, LANDFILL GAS, EACH 200 H.P.
3. CONDENSATE INJECTION LINE WITH EVAPORATION PAN
4. FLARE NO. 1, JOHN ZINK, LANDFILL GAS, 13'-0" DIA. X 60'-0" H, WITH A MULTIJET BURNER, PROPANE GAS PILOT, ELECTRIC IGNITER, UV FLAME SENSOR, THERMOCOUPLE WITH TEMPERATURE INDICATOR AND RECORDER, AUTOMATIC SHUTDOWN AND ALARM SYSTEM, AUTOMATIC COMBUSTION AIR REGULATING SYSTEM, TEMPERATURE CONTROLLER AND FLAME ARRESTOR.

Conditions :

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
3. THIS EQUIPMENT SHALL BE OPERATED AND MAINTAINED BY PERSONNEL PROPERLY TRAINED IN ITS OPERATION.
4. THE START-UP FOR THIS FLARE SHALL NOT EXCEED 30 MINUTES. ANY OUTAGE THAT RESULTS IN THE SHUTDOWN OF THE FLARE OR GAS COMPRESSOR AND THE SUBSEQUENT START-UP OR RESTART OF THE FLARE OR THE COMPRESSOR IS NOT CONSIDERED A BREAKDOWN, PROVIDING NO RAW LANDFILL GAS EMISSIONS OCCUR.

ORIGINAL

084



PERMIT TO CONSTRUCT

5. THE FLARE SHALL BE EQUIPPED WITH A TEMPERATURE INDICATOR AND RECORDER WHICH MEASURES AND RECORDS THE GAS TEMPERATURE (IN DEGREES F) IN THE FLARE STACK. THE TEMPERATURE INDICATOR AND RECORDER SHALL OPERATE WHENEVER THE FLARE IS IN OPERATION.
6. WHENEVER THE FLARE IS IN OPERATION, A TEMPERATURE OF NOT LESS THAN 1500 DEGREES F, AS MEASURED BY THE TEMPERATURE INDICATOR SHALL BE MAINTAINED IN THE FLARE STACK EXCEPT DURING START-UP TIME FOR NOT MORE THAN 30 MINUTES. THE THERMOCOUPLE USED TO MEASURE THE TEMPERATURE SHALL BE ABOVE THE FLAME ZONE AND AT LEAST 3 FEET BELOW THE TOP OF THE FLARE SHROUD AND AT LEAST 0.6 SECONDS DOWNSTREAM OF THE BURNER.
7. THE FLARE SHALL BE EQUIPPED WITH A FAILURE ALARM WITH AN AUTOMATIC BLOWER AND LANDFILL GAS SUPPLY VALVE SHUT-OFF SYSTEM APPROVED BY THE AQMD, IN ORDER TO ISOLATE THE FLARE FROM THE LANDFILL GAS SUPPLY LINE, TO SHUT-OFF THE BLOWER AND TO NOTIFY A RESPONSIBLE PARTY OF THE FAILURE.
8. THE SHUT-OFF SAFETY SYSTEM SHALL BE TESTED ANNUALLY FOR PROPER OPERATION AND THE RESULTS RECORDED.
9. A FLOW INDICATING AND RECORDING DEVICE SHALL BE INSTALLED IN THE LANDFILL GAS SUPPLY LINE TO THE FLARE TO MEASURE AND RECORD THE QUANTITY OF LANDFILL GAS (IN SCFM) BEING BURNED.
10. ALL RECORDING DEVICES SHALL BE SYNCHRONIZED WITH RESPECT TO THE TIME OF DAY.
11. A PRESSURE DIFFERENTIAL INDICATOR SHALL BE MAINTAINED ACROSS THE FLAME ARRESTOR.
12. CONDENSATE INJECTED INTO THE FLARE SHALL NOT EXCEED 5 GPM.
13. EMISSIONS RESULTING FROM THE FLARE SHALL NOT EXCEED THE FOLLOWING:

ROG	1.86 LBS/HR
NOX	10.0 LBS/HR
SOX	8.44 LBS/HR
CO	33.3 LBS/HR
PM10	3.0 LBS/HR
14. THE HEAT RELEASE FROM THE LANDFILL GAS BURNED IN THE FLARE SHALL NOT EXCEED 166 MM BTU/HR.
15. THE BTU CONTENT OF THE LANDFILL GAS SHALL BE MEASURED USING AN INSTRUMENT APPROVED BY THE AQMD AND RECORDED DAILY.
16. EMISSIONS OF NOX FROM THE FLARE SHALL NOT EXCEED 0.06 LBS PER MILLION BTU.

ORIGINAL

085



PERMIT TO CONSTRUCT

17. A SUFFICIENT NUMBER OF SIGHT GLASS WINDOWS SHALL BE INSTALLED IN THE FLARE TO ALLOW VISUAL INSPECTION OF THE FLAME AND THERMOCOUPLE LOCATION WITHIN THE FLARE AT ALL TIMES. ADEQUATE AND SAFE ACCESS SHALL BE PROVIDED FOR ALL PORTS UPON REQUEST BY AQMD PERSONNEL.
18. A SET OF FOUR SAMPLING PORTS SHALL BE INSTALLED IN THE FLARE SHROUD AND LOCATED AT LEAST TWO FEET ABOVE THE FLAME ZONE AND AT LEAST THREE FEET BELOW THE TOP OF THE FLARE SHROUD. EACH PORT SHALL BE INSTALLED AT 90 DEGREES APART AND SHALL CONSIST OF FOUR INCH COUPLINGS. ADEQUATE AND SAFE ACCESS TO ALL TEST PORTS SHALL BE PROVIDED BY THE APPLICANT WITHIN 24 HOURS OF A REQUEST BY THE AQMD TO CONDUCT A TEST.
19. A SAMPLING PORT, OR OTHER METHOD APPROVED BY THE AQMD, SHALL BE INSTALLED AT THE INLET GAS LINE TO THE FLARE.
20. THE SKIN TEMPERATURE OF THE FLARE SHROUD WITHIN FOUR FEET OF ALL THE SOURCE TEST PORTS SHALL NOT EXCEED 250 DEGREES F. IF A HEAT SHIELD IS REQUIRED TO MEET THIS REQUIREMENT, ITS DESIGN SHALL BE APPROVED BY THE AQMD PRIOR TO CONSTRUCTION. THE HEAT SHIELD, IF REQUIRED TO MEET THE TEMPERATURE REQUIREMENT, SHALL BE IN PLACE WHENEVER A SOURCE TEST IS CONDUCTED BY THE AQMD.
21. THE APPLICANT SHALL CONDUCT A SOURCE TEST ANNUALLY OR PER THE APPROVED 1150.1 COMPLIANCE PLAN. THE TEST SHALL BE PERFORMED IN ACCORDANCE WITH AQMD APPROVED TEST PROCEDURES. THE TEST SHALL INCLUDE, BUT MAY NOT BE LIMITED TO, A TEST OF THE FLARE FOR:
 - A. LANDFILL GAS COMPOSITION AND HEATING VALUE (INLET)
 - B. LANDFILL GAS FLOW RATE, SCFM (INLET)
 - C. TOTAL SULFUR COMPOUNDS AS H₂S, PPMV (INLET)
 - D. TEMPERATURE, F (EXHAUST)
 - E. FLOW RATE, DSCFM (EXHAUST)
 - F. NOX, LBS/HR AND LBS/MMBTU (EXHAUST)
 - G. SOX, LBS/HR (EXHAUST)
 - H. CO, LBS/HR (EXHAUST)
 - I. PM, LBS/HR AND GR/DSCF (EXHAUST)
 - J. TOTAL NON-METHANE ORGANICS, LBS/HR (INLET AND EXHAUST)
 - K. RULE 1150.1 TOXIC COMPOUNDS, PPMV (INLET AND EXHAUST)

THE SOURCE TEST SHALL BE CONDUCTED AT THE MAXIMUM FLOW RATE AVAILABLE AT THE TIME OF THE TEST BUT NOT TO EXCEED THE FLOW RATE ALLOWED BY THIS PERMIT

22. ANY BREAKDOWN OR MALFUNCTION OF THE LANDFILL GAS FLARE RESULTING IN THE EMISSION OF RAW LANDFILL GAS SHALL BE REPORTED TO THE AQMD WITHIN ONE HOUR AFTER OCCURRENCE, AND IMMEDIATE REMEDIAL MEASURES SHALL BE UNDERTAKEN TO CORRECT THE PROBLEM AND PREVENT FURTHER EMISSIONS INTO THE ATMOSPHERE.

ORIGINAL

086



PERMIT TO CONSTRUCT

23. ALL RECORDS SHALL BE KEPT FOR A PERIOD OF AT LEAST TWO YEARS AND SHALL BE MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST. A RECORD OF THE HOURS OF FLARE OPERATION SHALL BE INCLUDED.

Approval or denial of this application for permit to operate the above equipment will be made after an inspection to determine if the equipment has been constructed in accordance with the approved plans and specifications and if the equipment can be operated in compliance with all Rules of the South Coast Quality Management District.

Please notify TED KOWALCZYK at (909) 396 - 2592 when construction of equipment is complete.

This Permit to Construct is based on plans, specifications, and data submitted as it pertains to the release of air contaminants and control measures to reduce air contaminants. No approval or opinion concerning safety and other factors in design, construction or operation of equipment is expressed or implied.

This Permit to Construct shall serve as a temporary Permit to operate provided the Executive Officer is given prior notice of such intent to operate.

This Permit to Construct will become invalid if the permit to Operate is denied or if the application is cancelled. This PERMIT TO CONSTRUCT SHALL EXPIRE ONE YEAR FROM THE DATE OF ISSUANCE unless an extension is granted by the Executive Officer.

DMB/TK01

Dorris M. Bailey
DORRIS M. BAILEY
Principal office Assistant

ORIGINAL

087

